

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

APPENDICES



State of Connecticut
Department of Environmental Protection
Bureau of Natural Resources

CONNECTICUT'S
Comprehensive
Wildlife Conservation
Strategy

APPENDICES

Gina McCarthy, Commissioner
David K. Leff, Deputy Commissioner
Edward C. Parker, Chief, Bureau of Natural Resources

Developed by
Connecticut Department of Environmental Protection
Bureau of Natural Resources
in consultation with
Terwilliger Consulting, Inc.

October 1, 2005

Connecticut's DEP Bureau of Natural Resources Mission: To conserve, improve, and protect the natural resources and environment of the State of Connecticut and to do this in a way that encourages the social and economic development of Connecticut while preserving the natural environment and life forms it supports in a delicate, interrelated and complex balance to the end that the state may fulfill its responsibility to the environment for present and future generations.

The Connecticut Department of Environmental Protection is an affirmative action/equal opportunity employer, providing programs and services in a fair and impartial manner. In conformance with the Americans with Disabilities Act, DEP makes every effort to provide equally effective services for persons with disabilities. Individuals with disabilities needing auxiliary aids or services, or for more information by voice or TTY/TDD, call (860) 424-3000.

List of Appendices

Note that appendices are numbered to correspond to chapter numbers and required elements. There are no appendices for chapters and elements 5 and 6.

- Appendix 1a: Sources of Information
- Appendix 1b: Status of Connecticut's Full Array of Wildlife
- Appendix 1c: Criteria Used to Identify Connecticut's GCN Species
- Appendix 1d: Priority Bird Species – Status, Threats, Actions
- Appendix 1e: Compilation of Existing Conservation and Management Plans
- Appendix 2a: Connecticut's Vegetative Communities and Corresponding CWCS Habitats
- Appendix 2b: Crosswalk of Connecticut's Habitats
- Appendix 3: Threats to Connecticut's Wildlife and Habitats and their Links to Conservation Actions and Inventory, Research, and Monitoring Needs
- Appendix 4: Compilation and Prioritization of Conservation Actions and Threats from Existing State, Regional, National and International Conservation Plans
- Appendix 5: None
- Appendix 6: None
- Appendix 7a: Connecticut's Wildlife Conservation Partners and Programs
- Appendix 7b: CWCS Development Process Plan and Schedule
- Appendix 7c: Survey Results from Regional Municipality Workshops 2004-2005
- Appendix 8a: List of Stakeholders, Collaborators and Experts
- Appendix 8b: Public Input Plan
- Appendix 8c: Public Participation Mechanisms

Appendix 1a: Sources of Information

This appendix lists the information sources that were researched, compiled, and reviewed in order to best determine and present the status of the full array of wildlife and its conservation in Connecticut. A wide diversity of literature and programs was consulted and compiled through extensive research and coordination efforts. Some of these sources are referenced in the Literature Cited and Additional Reference Sources section of this document. The remaining sources are provided here as a resource for users of this document, as well as for future revisions. Sources include: published and unpublished data, reports from existing conservation programs, and correspondence. The sources are in alphabetical order.

<i>Data</i>	<i>Source</i>
American Fisheries Society Policy Statements for conserving fishery resources	American Fisheries Society
An Ocean Blueprint for the 21 st Century	U.S. Commission on Ocean Policy
Anadromous rainbow smelt in Connecticut: Assessment of populations, conservation status, and need for restoration plan	CT DEP; Schultz and Neumann (2003b)
Annual Status of U.S. Fisheries – 2001	NOAA (2002)
Appalachian Cooperative Grouse Research Project	Ruffed Grouse Society; Reynolds et al. (2000)
Aquatic Species at Risk (freshwater mussels, freshwater fish, marine fish)	American Fisheries Society
Assessment of alewife and blueback herring populations in Connecticut coastal streams and Connecticut River tributaries	CT DEP; Schultz and Neumann (2003a)
Atlas of Cerulean Warbler Populations	Rosenberg, K. (2000)
Best management practices for herpetofauna	Partners in Amphibian and Reptile Conservation (PARC); MCA; Calhoun and Klemens (2002)
Breeding Bird Atlas	Bevier (1994) [CT DEP]
Butterfly Atlas	Connecticut Butterfly Association
Clean Air Act State Implementation Plan	CT DEP, Bureau of Air Management
Connecticut Anadromous Fish Investigation	CT DEP, BNR, Marine Fisheries Division (1974-2004)
Connecticut Blueprint for Conservation	TNC
Connecticut Conservation and Development Plan	Office of Policy and Management (OPM)
Connecticut Rivers Assessment	CT DEP, National Park Service, and Milone and MacBroom, Inc. (1993)
Connecticut Statewide Forest Resource Plan	CT DEP, Forestry Division

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Data</i>	<i>Source</i>
Conservation grant programs in Connecticut (e.g., EQIP, WHIP, GRP, FRPP, CSP)	Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA)
Conservation Status of Freshwater Mussels of the United States and Canada	AFS; Williams et al. (1993)
Cornell Lab of Ornithology reports and publications	Cornell Lab of Ornithology
CT Open Space Initiative (Green Plan)	CT DEP, Division of Land Acquisition and Management
DEP, Agency, Division, and Program Strategic and Operational Plans	CT DEP, BNR, DFW
Distribution and Habitat Characteristics of Banded Sunfish in Connecticut	CT DEP, Inland Fisheries Division; Jann et al. (1999)
Eightmile River Wild and Scenic River Study	NPS
Electrofishing Survey of Selected Connecticut Lakes	CT DEP, Inland Fisheries Division; Jacobs and O'Donnell (1996)
Endangered Invertebrates: the case for greater attention to invertebrate conservation	Xerxes Society; Hoffman Black et al. (2001)
Essential Fish Habitat	NEFMC (1998)
Farmington Valley Biodiversity Project	Farmington River Valley Watershed Association and W Hartford Science Museum
Field Guide to the Freshwater Mussels of Connecticut	CT DEP Wildlife Division (2003)
Fisheries Division Annual and Project Reports, Unpublished	CT DEP, BNR, Fisheries Division
Fishes of North America Endangered, Threatened, or of Special Concern: 1989	AFS; Williams et al. (1989)
Forest Inventory and Analysis Program	U.S. Forest Service
Forest Land Enhancement Program State Priority Plan	CT DEP, Forestry Division
Forest Legacy Program	CT DEP, Forestry Division; USFS
Freshwater Fishes of Connecticut	CT DEP, EGIC, CT Geological and Natural History Survey; Whitworth (1996)
Game (Harvested Species annual/ program reports- unpublished)	CT DEP, Wildlife Division
Grassland Bird Database	CT DEP, statewide volunteers
Grassland Bird Reports	Northern Prairie Wildlife Research Center, USGS

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Data</i>	<i>Source</i>
Habitat classification systems	U.S. Forest Service; NatureServe; TNC; Federal Geographic Data Committee (FGDC); University of Massachusetts (Zuckerberg et al. 2004); Metzler and Barrett (2005); Anderson et al. (1976); Cowardin et al. (1979)
Habitats and species in greatest conservation need in CT	Taxa experts
Herpetofauna Atlas of CT	M. Klemens, MCA
Imperiled Ecosystems of Connecticut	Metzler and Wagner (1998)
Important Bird Areas (IBA) Program	Connecticut Audubon, National Audubon Society
International Shorebird Survey	Manomet Center for Conservation Sciences (1974)
Landowner Assistance Program, Tier 1,2 Grant Proposals and supporting documentation	CT DEP, Wildlife Division
Land Use and Land Cover Project	UCONN, Center for Land use Education And Research
Long Island Sound Environmental Studies Program	USGS
Long Island Sound Study	EPA, OLISP; Save the Sound
Lower Connecticut River	Rivers Alliance; Connecticut River Salmon Association; Connecticut River Watershed Council; TNC
Management Recommendations for Marshbirds (Summary from the Marshbird Conservation Workshop)	USFWS (2001)
Marine, estuarine, and diadromous fish stocks at risk of extinction in North America	AFS; Musick et al. (2000)
Marine fish, marine mammal, and invertebrate management plans and stock assessments	NMFS and ASMFC
MCA Surveys and Workshops for local conservation planning	Municipalities and local decision-maker groups (i.e. Litchfield city land planner group); Town conservation groups; Town Conservation and Inland Wetland Commissions
Metacomet-Mondanock-Mattabesett National Scenic Trail Study	NPS
Migratory Bird Plans, NALCP, NAWP, etc.	USFWS, PIF
Natural Biological Diversity Database (NDDB)	CT DEP, EGIC, CT Geological and Natural History Survey

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Data</i>	<i>Source</i>
Natural History Surveys, CT Geological and Natural History Survey Reports and Maps	CT DEP, EGIC
Natural Resources Inventory Program	USDA, NRCS
NatureServe Explorer: An Online Encyclopedia of Life	NatureServe
Nonpoint Education for Municipal Officials (NEMO)	University of Connecticut (UCONN)
Partners in Flight plans, reports, website	PIF
Potential Impact of Road-Stream Crossings (Culverts) on the Upstream Passage of Aquatic Macroinvertebrate	Xerxes Society Vaughan (2002)
Private Landowner Program	CT DEP, Wildlife Division
Quinebaug and Shetucket Rivers Valley National Heritage Corridor Program	Green Valley Institute; National Park Service; Quinebaug-Shetucket Heritage Corridor, Inc.
Rare and Endangered Species of CT	Dowhan and Craig (1976); CT DEP, Wildlife Division
Resource Protection Areas	EPA; CT DEP
Rotating Basin Survey	CT DEP, Bureau of Water Resources
Ruffed grouse and American woodcock population data and reports	Ruffed Grouse Society; USFWS Region 5 Woodcock Report
Saltwater Fishes of Connecticut	CT DEP, EGIC, Geological and Natural History Survey; Thomson et al. (1978)
Shorebird Management Manual	Helmets (1992)
Shorebird Plan, Workshop Reports	Clark and Niles (2000)
Southern New England Gap Analysis Program (GAP) and final 2004 report	University of Massachusetts; U.S. Geological Survey (USGS)
Species Accounts for the Rare Fishes of New York	NY Department of Environmental Conservation (2001)
Species' life history data	NatureServe; Northeast Wildlife Administrators; USFWS; scientific literature, DEP program databases and unpublished reports
Specimen collections and museums	UCONN (James Fisher- mammals, David Wagner, Michael Thomas- inverts)
Statewide Comprehensive Outdoor Recreation Plan	CT DEP; UCONN, Center for Population Research
Statewide Conservation and Development Plan	CT Office of Policy and Management

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Data</i>	<i>Source</i>
Stream survey and water quality monitoring data (including 303,305 reports)	CT DEP, Bureau of Water Management
Study of Marine Recreational Fisheries in Connecticut	CT DEP, Marine Fisheries Division (1984-2004)
Survey of Connecticut Streams and Rivers – Connecticut River Tributaries, Scantic River, Mattabesset River, Salmon River, Coginchaug River and Eightmile River Drainages	CT DEP, Inland Fisheries Division; Hagstrom et al. (1990)
Survey of Connecticut Streams and Rivers – Lower Housatonic River and Naugatuck River Drainages	CT DEP, Inland Fisheries Division; Hagstrom et al. (1992)
Survey of Connecticut Streams and Rivers – Statewide Summary	CT DEP, Inland Fisheries Division; Hagstrom et al. (1995)
Surveys on conservation needs in CT	CT DEP CWCS unpublished; federal agencies; non-governmental organizations; municipalities
Technical Committees of the NEFWA reports and publications on Deer, Turkey, Furbearer, Nongame, etc.	NEFWA Technical Committees
Tomcod in Connecticut: Assessment of populations, conservation status, and need for restoration plan	CT DEP; Schultz and Neumann (2003c)
Urban and Community Forestry Program	CT DEP, Forestry Division; UCONN, Cooperative Extension Service
Water Quality Assessment Plan	CT DEP, Bureau of Water Management
Waterbird Plans and reports	USFWS; MANEM; CT Audubon
Waterfowl Population Status 2003	USFWS
Wildlife Division Annual and Project Reports, unpublished	CT DEP, BNR, Wildlife Division

Publicly available Information Sources Consulted (on the World Wide Web)

<i>Source</i>	<i>Website</i>
American Fisheries Society	http://www.fisheries.org
Aspetuck Land Trust	http://www.aspetucklandtrust.org
Atlantic States Marine Fisheries Commission	http://www.asafc.org/
Audubon Connecticut	http://greenwich.center.audubon.org/

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Source</i>	<i>Website</i>
Avian Records Committee of Connecticut	http://www.ctbirding.org/ARCC.htm
Bat Conservation International	http://www.batcon.org/
BCR 30 Habitat Assessment	http://fsweb.wm.edu/ccb/habitat/habitat_home.cfm
Coastal America	http://www.coastalamerica.gov
Connecticut Association of Conservation and Inland Wetlands Commission (CACIWC)	http://www.caciwc.org/
Connecticut Audubon Society	http://www.ctaudubon.org
Connecticut Butterfly Atlas Project	http://george.peabody.yale.edu/cbap/
Connecticut's Changing Landscape Project (UConn)	http://clear.uconn.edu/projects/landscape/index.htm
CT Council on Environmental Quality	http://www.ct.gov/ceq/site/default.asp
Connecticut Coverts Program	http://www.canr.uconn.edu/ces/forest/coverts.htm
Connecticut Department of Agriculture	http://www.ct.gov/doag/site/default.asp
Connecticut Department of Environmental Protection (CT DEP)	http://dep.state.ct.us/aboutdep/progacti.htm
CT Geological and Natural History Survey	http://dep.state.ct.us/cgnhs/cgnhs.htm
Connecticut Greenways Program	http://www.dep.state.ct.us/stateparks/greenways/designated.htm
CT Natural Biological Diversity Database	http://dep.state.ct.us/cgnhs/nddb/nddb2.htm
CT Office of Long Island Sound Program	http://dep.state.ct.us/olisp/index.htm
CT Office of Policy and Management	http://www.opm.state.ct.us
Connecticut Ornithological Association (COA)	http://www.ctbirding.org
Connecticut River Estuary Regional Planning Agency (CRERPA)	http://www.crerpa.org/
Connecticut River Gateway Commission	http://www.crerpa.org/gateway.html
Connecticut River Salmon Restoration Association	http://www.ctriversalmon.org
Connecticut River Watershed Council	http://www.ctriver.org
Connecticut Sea Grant Program	http://www.seagrant.uconn.edu/
Connecticut Waterfowl Association	http://www.ctwaterfowlers.org
ConserveOnline	http://www.conserveonline.org/
Cooperative Extension Service, UConn	http://www.canr.uconn.edu/ces/
Ducks Unlimited	http://www.ducks.org
Environmental and Geographic Information Center	http://dep.state.ct.us/cgnhs/index.htm
Environmental Protection Agency	http://www.epa.gov

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Source</i>	<i>Website</i>
EPA Long Island Sound Program	http://www.epa.gov/region01/eco/lis
Essex Land Conservation Trust	http://www.essexlandtrust.org
Farmington River Watershed Association	http://www.frwa.org/programs/
Golden Hill Paugussett Tribe	http://paugussett.itgo.com
Golden-winged Warbler Atlas Project	www.birds.cornell.edu/gowap/
Greenwich Land Trust	http://www.gltrust.org
Green Valley Institute	http://www2.ncdc.noaa.gov/docs/gviug/
Important Bird Area Program	http://www.audubon.org/bird/iba
International Association of Fish and Wildlife Agencies (IAFWA)	http://www.iafwa.org/
International Marine Mammal Association	http://www.imma.org
International Shorebird Survey	http://www.shorebirdworld.org/
International Union for Conservation of Nature and Natural Resources	http://www.redlist.org
Invasive Plant Atlas of New England	http://invasives.eeb.uconn.edu/ipane/
Long Island Sound Environmental Studies Program, USGS	http://woodshole.er.usgs.gov/project-pages/longislandsound/index.htm
Long Island Sound Soundkeeper	http://www.soundkeeper.org/
Long Island Sound Study	http://www.longislandsoundstudy.net/
Map and Geographic Information Center (MAGIC)	http://magic.lib.uconn.edu/
Mashantucket Pequot Tribal Nation	http://www.pequotmuseum.com
Mid-Atlantic Fishery Management Council	http://www.mafmc.org/mid-atlantic/mafmc.htm
Mohegan Tribal Nation	http://www.mohegan.nsn.us
Mystic Aquarium Institute for Exploration	http://www.mysticaquarium.org
National Audubon Society	http://www.audubon.org
National Estuarine Research Reserve Program	http://nerrs.noaa.gov
National Marine Fisheries Service	http://www.nmfs.noaa.gov/
National Oceanic and Atmospheric Administration (NOAA)	http://www.noaa.gov
NOAA Office of Ocean and Coastal Resource Management	http://coastalmanagement.noaa.gov/
NOAA Coastal Services Center	http://www.csc.noaa.gov/
NOAA Office of Response and Restoration	http://response.restoration.noaa.gov

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Source</i>	<i>Website</i>
National databases	http://www.pwrc/usgs.gov/birds
National Park Service	http://www.nps.gov
National Water Quality Assessment Program, USGS	http://ma.water.usgs.gov/projects/MA-100/
Native American Fish and Wildlife Society	http://www.nafws.org/
Natural Resources Conservation Service	http://www.nrcs.usda.gov
National Resources Inventory Program	http://www.nrcs.usda.gov/technical/NRI/
NatureServe	http://www.natureserve.org/
New England Fishery Management Council	http://www.nefmc.org/
New Hartford Land Trust	http://www.leachmichaud.net/NHLT/Index.html
North American Bat Conservation Partnership (NABCP)	http://www.batcon.org/nabcp/newsite/index.html
Northern Prairie Wildlife Research Center	http://www.npwrc.usgs.gov/
Old Lyme Conservation Trust	http://www.old-lymeconservtrust.org/menu.html
Partners in Amphibian and Reptile Conservation (PARC)	http://www.parcplace.org
Partners In Flight	http://www.partnersinflight.org/
Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/
Paucatuck Eastern Pequot Indian Tribe	http://www.paucatuck.org/
Pew Oceans Commission	http://www.pewoceans.org
Quinebaug-Shetucket Heritage Corridor, Inc. (QSHC)	http://www.thelastgreenvalley.org
Regional Plan Association	http://www.rpa.org
Rivers Alliance	http://www.riversalliance.org
Ruffed Grouse Society	http://www.ruffedgrousesociety.org
Save the Sound	http://www.savethesound.org/index.htm
Schaghticoke Tribe	http://www.schaghticoke.com
Silvio O. Conte National Wildlife Refuge	http://www.fws.gov/r5soc/
Southern New England-New York Bight Coastal Program, USFWS	http://www.fws.gov/r5snep/nep1.htm
Sportsmens Land Trust	http://www.sportslandtrust.org/
Trout Unlimited	http://www.tu.org/index.asp
Trust for Public Land	http://www.tpl.org
U.S. Army Corps of Engineers, New England District	http://www.nae.usace.army.mil
U.S. Bureau of Indian Affairs	http://www.doi.gov/bureau-indian-affairs.html

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<i>Source</i>	<i>Website</i>
U.S. Department of Agriculture	http://www.usda.gov
U.S. Fish and Wildlife Service (USFWS)	http://www.fws.gov
USFWS Fisheries Program	http://www.fws.gov/r5crc/
USFWS Migratory Birds Program	http://migratorybirds.fws.gov
USFWS National Wetlands Inventory	http://www.nwi.fws.gov
U.S. Forest Service (USFS)	http://www.fs.fed.us/
USFS Forest Inventory and Analysis Program	http://www.fs.fed.us/ne/fia/states/ct/index.html
U.S. Geological Survey (USGS)	http://www.usgs.gov
USGS Biological Resources Division	http://biology.usgs.gov/state.partners/activities/ct-act.html
USGS Water Resources Division	http://ct.water.usgs.gov/
University of Connecticut (UConn) CLEAR Program	http://clear.uconn.edu
UConn Biological Collections	http://collections2.eeb.uconn.edu/collections/chp.html
UConn Center for Conservation and Biodiversity	http://www.eeb.uconn.edu/bioconctr/
UConn NEMO Program	http://nemo.uconn.edu/
UConn Wildlife Conservation Research Center	http://www.canr.uconn.edu/nrme/programs/wildlife/wcrc/index.htm
Waterfowl Mid. Winter Inventory data	http://www.pwrc.usgs.gov/library/duckdata/
Xerces Society	http://www.xerces.org

Appendix 1b: Status of Connecticut's Full Array of Wildlife

This appendix lists all of the wildlife species that are known to occur or have occurred in the State of Connecticut, along with the state, regional, and national status categories (where known) for each species. The appendix directly addresses Element 1 by presenting the best available information on distribution and abundance status of the full array of Connecticut's wildlife. The information was obtained from the most current CT DEP BNR Wildlife Division database, resulting from both expert review and existing DEP program sources, which includes databases from the Natural Diversity Data Base (NDDB), Fisheries Division, and Water Bureau. Standardized ranks from the USFWS, CT DEP, and NatureServe were used to compile this status list. The ranks were derived from the best available information on abundance and distribution status at state, national, and global levels. More detailed information is available for some species in certain taxa (in the form of an Atlas or other reports cited in Chapter 1). This is the most complete and current checklist of wildlife species (along with standardized status categories) in Connecticut. The CT DEP BNR Wildlife Division produced the checklist for this CWCS, with assistance from its partners.

Status categories include:

USES A = Federal Endangered Species Act. Possible values include Threatened (T), Endangered (E), Partial Status (PS)

CTESA = Connecticut State Endangered Species Act. Possible values include Threatened (T), Endangered (E), Special Concern (SC). The suffix X is used to indicate extirpated species.

Global Rank = TNC/ NatureServe Global Conservation Status rank. See page 49 of Appendix 1b for definitions.

State Rank = TNC/ NatureServe State (subnational) Conservation Status Rank. See page 49 of Appendix 1b for definitions.

NE Rank = Species of Regional Conservation Concern from NEES&WDTC. X indicates that the species is NE Ranked.

Common Name	Scientific Name	USES A	CTESA	Global Rank	State Rank	NE Rank
Mammals						
Allegheny Woodrat	<i>Neotoma magister</i>		SCX	G3G4	SNR	
Beaver	<i>Castor canadensis</i>			G5	S5	
Beluga	<i>Delphinapterus leucas</i>	PS		G4		
Big Brown Bat	<i>Eptesicus fuscus</i>			G5	S5	
Black Bear	<i>Ursus americanus</i>			G5	S3	
Blue Whale	<i>Balaenoptera musculus</i>	E		G3G4		
Bobcat	<i>Felis rufus</i>			G5	S2	
Bottlenose Dolphin	<i>Tursiops truncatus</i>			G5		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Common Dolphin	<i>Delphinus delphis</i>			G5		
Coyote	<i>Canis latrans</i>			G5	S5	
Deer Mouse	<i>Peromyscus maniculatus</i>			G5	S3	
Dense-beaked Whale	<i>Mesoplodon densirostris</i>			G4		
Eastern Chipmunk	<i>Tamias striatus</i>			G5	S5	
Eastern Cottontail	<i>Sylvilagus floridanus</i>			G5	S5	
Eastern Fox Squirrel	<i>Sciurus niger</i>			G5	SX	
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>			G5	S5	
Eastern Mole	<i>Scalopus aquaticus</i>			G5	S5	
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>			G5	S4	
Eastern Small-footed Bat	<i>Myotis leibii</i>		SCX	G3	SHN	X
European Hare	<i>Lepus europaeus</i>			G5	SNA	
Finback Whale	<i>Balaenoptera physalus</i>	E		G3G4		
Fisher	<i>Martes pennanti</i>			G5	S2	
Gray Fox	<i>Urocyon cinereoargenteus</i>			G5	S5	
Gray Grampus	<i>Grampus griseus</i>			G5		
Gray Seal	<i>Halichoerus grypus</i>		SC	G4G5	S4N	
Gray Wolf	<i>Canis lupus</i>		SCX	G4	SX	
Hairy-Tailed Mole	<i>Parascalops breweri</i>			G5	S5	
Harbor Porpoise	<i>Phocoena phocoena</i>		SC	G4G5	SNA	X
Harbor Seal	<i>Phoca vitulina</i>			G5	SNA	
Harp Seal	<i>Pagophilus groenlandicus</i>			G5		
Hooded Seal	<i>Cystophora cristata</i>			G4G5		
Hoary Bat	<i>Lasiurus cinereus</i>		SC	G5	S3	X
House Mouse	<i>Mus musculus</i>			G5	SNA	
Humpback Whale	<i>Megaptera novaeangliae</i>	E		G3		
Indiana Bat	<i>Myotis sodalis</i>	E	E	G2	SHN	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Killer Whale	<i>Orcinus orca</i>		G4G5			
Least Shrew	<i>Cryptotis parva</i>		E	G5	S1	X
Little Brown Bat	<i>Myotis lucifugus</i>			G5	S5	
Long-tailed Weasel	<i>Mustela frenata</i>			G5	S5	
Masked Shrew	<i>Sorex cinereus</i>			G5	S5	
Meadow Jumping Mouse	<i>Zapus hudsonius</i>			G5	S5	
Meadow Vole	<i>Microtus pennsylvanicus</i>			G5	S5	
Mink	<i>Mustela vison</i>			G5	S5	
Minke Whale	<i>Balaenoptera acutorostrata</i>			G5		
Moose	<i>Alces alces</i>			G5	SX	
Mountain Lion	<i>Puma concolor</i>			G5	SH	
Muskrat	<i>Ondatra zibethicus</i>			G5	S5	
New England Cottontail	<i>Sylvilagus transitionalis</i>			G4	S2	X
North Sea-beaked Whale	<i>Mesoplodon bidens</i>			G3		
Northern Bottlenose Whale	<i>Hyperoodon ampullatus</i>			G4		
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>			G5	SNA	
Northern Long-eared Bat	<i>Myotis septentrionalis</i>			G4	SU	
Northern Short-tailed Shrew	<i>Blarina brevicauda</i>			G5	S5	
Northern Water Shrew	<i>Sorex palustris</i>			G5	S3	
Norway Rat	<i>Rattus norvegicus</i>			G5	SNA	
Pilot Whale	<i>Globicephala melaena</i>			G5		
Porcupine	<i>Erethizon dorsatum</i>			G5	S5	
Pygmy Sperm Whale	<i>Kogia breviceps</i>			G4		
Raccoon	<i>Procyon lotor</i>			G5	S5	
Red Bat	<i>Lasiurus borealis</i>		SC	G5	S3	X
Red Fox	<i>Vulpes vulpes</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Red Squirrel	<i>Tamiasciurus hudsonicus</i>			G5	S5	
River Otter	<i>Lutra canadensis</i>			G5	S5	
Sei Whale	<i>Balaenoptera borealis</i>	E		G3		
Short-tailed Weasel	<i>Mustela erminea</i>			G5	S5	
Silver-haired Bat	<i>Lasionycteris noctivagans</i>		SC	G5	SNA	X
Smoky Shrew	<i>Sorex fumeus</i>			G5	S5	
Snowshoe Hare	<i>Lepus americanus</i>			G5	S4	
Southern Bog Lemming	<i>Synaptomys cooperi</i>		SC	G5	S3	
Southern Flying Squirrel	<i>Glaucomys volans</i>			G5	S5	
Southern Red-backed Vole	<i>Clethrionomys gapperi</i>			G5	S5	
Sperm Whale	<i>Physeter catodon</i>	E		G3G4		
Star-nosed Mole	<i>Condylura cristata</i>			G5	S5	
Striped Dolphin	<i>Stenella coeruleoalba</i>			G5		
Striped Skunk	<i>Mephitis mephitis</i>			G5	S5	
True's Beaked Whale	<i>Mesoplodon mirus</i>			G3		
Virginia Opossum	<i>Didelphis virginiana</i>			G5	S5	
White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>			G4		
White-footed Mouse	<i>Peromyscus leucopus</i>			G5	S5	
White-sided Dolphin	<i>Lagenorhynchus acutus</i>			G4		
White-tailed Deer	<i>Odocoileus virginianus</i>			G5	S5	
Woodchuck	<i>Marmota monax</i>			G5	S5	
Woodland Jumping Mouse	<i>Napaeozapus insignis</i>			G5	S5	
Woodland Vole	<i>Microtus pinetorum</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Birds						
Acadian Flycatcher	<i>Empidonax virescens</i>			G5	S4B	
Alder Flycatcher	<i>Empidonax alnorum</i>		SC	G5	S5B	
American Avocet	<i>Recurvirostra americana</i>			G5		
American Bittern	<i>Botaurus lentiginosus</i>		E	G4	S1B	X
American Black Duck	<i>Anas rubripes</i>			G5	S3B,S4N	
American Coot	<i>Fulica americana</i>			G5	SNA	
American Crow	<i>Corvus brachyrhynchos</i>			G5	S5	
American Golden-plover	<i>Pluvialis dominica</i>			G5	SNA	
American Goldfinch	<i>Carduelis tristis</i>			G5	S5B	
American Kestrel	<i>Falco sparverius</i>		T	G5	S2	
American Oystercatcher	<i>Haematopus palliatus</i>		SC	G5	S1B	
American Pipit	<i>Anthus rubescens</i>			G5	SNA	
American Redstart	<i>Setophaga ruticilla</i>			G5	S5B	
American Robin	<i>Turdus migratorius</i>			G5	S5B	
American Tree Sparrow	<i>Spizella arborea</i>			G5	S5N	
American Wigeon	<i>Anas americana</i>			G5	SNA	
American Woodcock	<i>Scolopax minor</i>			G5	S5	
Arctic Tern	<i>Sterna paradisaea</i>			G5		
Audubon's Shearwater	<i>Puffinus iherminieri</i>			G4G5		
Baird's Sandpiper	<i>Calidris bairdii</i>			G5	SNA	
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	E	G4	S1B,S3N	
Baltimore Oriole	<i>Icterus galbula</i>			G5	S5B	
Bank Swallow	<i>Riparia riparia</i>			G5	S5B	
Barn Owl	<i>Tyto alba</i>		E	G5	S2	
Barn Swallow	<i>Hirundo rustica</i>			G5	S5B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Barred Owl	<i>Strix varia</i>			G5	S5	
Barrow's Goldeneye	<i>Bucephala islandica</i>			G5	SNAN	
Bay-breasted Warbler	<i>Dendroica castanea</i>			G5	SNA	
Belted Kingfisher	<i>Ceryle alcyon</i>			G5	S5B	
Bicknell's Thrush	<i>Catharus bicknelli</i>			G4	SNR	
Black Rail	<i>Laterallus jamaicensis</i>		E	G4	S1B	
Black Scoter	<i>Melanitta nigra</i>			G5	SNA	
Black Skimmer	<i>Rynchops niger</i>			G5	SNAB	
Black Tern	<i>Chlidonias niger</i>			G4	SNA	
Black Vulture	<i>Coragyps atratus</i>			G5	SNAN	
Black-and-white Warbler	<i>Mniotilta varia</i>			G5	S5B	
Black-bellied Plover	<i>Pluvialis squatarola</i>			G5	SNA	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			G5	S5B	
Blackburnian Warbler	<i>Dendroica fusca</i>			G5	S5B	
Black-capped Chickadee	<i>Poecile atricapillus</i>			G5	S5	
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>			G5	S2B	
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			G5	SNAN	
Black-legged Kittiwake	<i>Rissa tridactyla</i>			G5	SNAN	
Blackpoll Warbler	<i>Dendroica striata</i>			G5	SNA	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>			G5	S5B	
Black-throated Green Warbler	<i>Dendroica virens</i>			G5	S5B	
Blue Grosbeak	<i>Guiraca caerulea</i>			G5	SNAN	
Blue Jay	<i>Cyanocitta cristata</i>			G5	S5	
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>			G5	S5B	
Blue-headed Vireo	<i>Vireo solitarius</i>			G5	S5B	
Blue-winged Teal	<i>Anas discors</i>		T	G5	S2B	
Blue-winged Warbler	<i>Vermivora pinus</i>			G5	S5B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Boat-tailed Grackle	<i>Quiscalus major</i>			G5	SNAN	
Bobolink	<i>Dolichonyx oryzivorus</i>		SC	G5	S4B	
Bohemian Waxwing	<i>Bombycilla garrulus</i>			G5		
Bonaparte's Gull	<i>Larus philadelphia</i>			G5	SNA	
Boreal Chickadee	<i>Poecile hudsonica</i>			G5	SNAN	
Boreal Owl	<i>Aegolius funereus</i>			G5		
Brant	<i>Branta bernicla</i>			G5	SNA	
Bridled Tern	<i>Sterna anaethetus</i>			G5		
Broad-winged Hawk	<i>Buteo platypterus</i>			G5	S5B	
Brown Creeper	<i>Certhia americana</i>			G5	S5	
Brown Thrasher	<i>Toxostoma rufum</i>		SC	G5	S5B	
Brown-headed Cowbird	<i>Molothrus ater</i>			G5	S5B	
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>			G4	SNA	
Bufflehead	<i>Bucephala albeola</i>			G5	SNA	
Canada Goose	<i>Branta canadensis</i>			G5	S5	
Canada Warbler	<i>Wilsonia canadensis</i>			G5	S5B	X
Canvasback	<i>Aythya valisineria</i>			G5	SNA	
Cape May Warbler	<i>Dendroica tigrina</i>			G5	SNA	
Carolina Wren	<i>Thryothorus ludovicianus</i>			G5	S5	
Caspian Tern	<i>Sterna caspia</i>			G5	SNA	
Cattle Egret	<i>Bubulcus ibis</i>			G5	S1B	
Cedar Waxwing	<i>Bombycilla cedrorum</i>			G5	S5B	
Cerulean Warbler	<i>Dendroica cerulea</i>			G4	S3B	X
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			G5	S5B	
Chimney Swift	<i>Chaetura pelagica</i>			G5	S5B	
Chipping Sparrow	<i>Spizella passerina</i>			G5	S5B	
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>			G5	SNAN	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Clapper Rail	<i>Rallus longirostris</i>			G5	S3B	
Clay-colored Sparrow	<i>Spizella pallida</i>			G5	SNAN	
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>			G5	S3B	
Common Black-headed Gull	<i>Larus ridibundus</i>			G5	SNA	
Common Eider	<i>Somateria mollissima</i>			G5	SNAN	
Common Goldeneye	<i>Bucephala clangula</i>			G5	SNA	
Common Grackle	<i>Quiscalus quiscula</i>			G5	S5B	
Common Loon	<i>Gavia immer</i>		SC	G5	S1B	
Common Merganser	<i>Mergus merganser</i>			G5	S3B	
Common Moorhen	<i>Gallinula chloropus</i>		E	G5	S2B	
Common Nighthawk	<i>Chordeiles minor</i>		E	G5	S1B	
Common Raven	<i>Corvus corax</i>		SC	G5	S2B,SNA	
Common Redpoll	<i>Carduelis flammea</i>			G5	SNAN	
Common Tern	<i>Sterna hirundo</i>		SC	G5	S3B	X
Common Yellowthroat	<i>Geothlypis trichas</i>			G5	S5B	
Connecticut Warbler	<i>Oporornis agilis</i>			G4	SNA	
Cooper's Hawk	<i>Accipiter cooperii</i>			G5	S2B	
Cory's Shearwater	<i>Calonectris diomedea</i>			G5		
Curlew Sandpiper	<i>Calidris ferruginea</i>			G5?	SNA	
Dark-eyed Junco	<i>Junco hyemalis</i>			G5	S5B,S5N	
Dickcissel	<i>Spiza americana</i>			G5	S1B	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			G5	S3B,S4N	
Downy Woodpecker	<i>Picoides pubescens</i>			G5	S5	
Dunlin	<i>Calidris alpina</i>			G5	SNA	
Eared Grebe	<i>Podiceps nigricollis</i>			G5		
Eastern Bluebird	<i>Sialia sialis</i>			G5	S4	
Eastern Kingbird	<i>Tyrannus tyrannus</i>			G5	S5B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Eastern Meadowlark	<i>Sturnella magna</i>		SC	G5	S4B	
Eastern Phoebe	<i>Sayornis phoebe</i>			G5	S5B	
Eastern Screech-owl	<i>Otus asio</i>			G5	S5	
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			G5	S5B	
Eastern Wood-pewee	<i>Contopus virens</i>			G5	S5B	
Eskimo Curlew	<i>Numenius borealis</i>			GH	SHN	
European Starling	<i>Sturnus vulgaris</i>			G5	SNA	
Evening Grosbeak	<i>Coccothraustes vespertinus</i>			G5	SNAB	
Field Sparrow	<i>Spizella pusilla</i>			G5	S5B	
Fish Crow	<i>Corvus ossifragus</i>			G5	S4	
Forster's Tern	<i>Sterna forsteri</i>			G5	SNA	
Fox Sparrow	<i>Passerella iliaca</i>			G5	SNA	
Gadwall	<i>Anas strepera</i>			G5	S2B,S4N	
Glaucous Gull	<i>Larus hyperboreus</i>			G5	SNA	
Glossy Ibis	<i>Plegadis falcinellus</i>		SC	G5	S1B	
Golden Eagle	<i>Aquila chrysaetos</i>			G5	SNA	
Golden-crowned Kinglet	<i>Regulus satrapa</i>			G5	S2B	
Golden-winged Warbler	<i>Vermivora chrysoptera</i>		E	G4	S2B	X
Grasshopper Sparrow	<i>Ammodramus savannarum</i>		E	G5	S1B	
Gray Catbird	<i>Dumetella carolinensis</i>			G5	S5B	
Gray-cheeked Thrush	<i>Catharus minimus</i>			G5	SNA	
Great Black-backed Gull	<i>Larus marinus</i>			G5	S5	
Great Blue Heron	<i>Ardea herodias</i>			G5	S3B	
Great Cormorant	<i>Phalacrocorax carbo</i>			G5	SNA	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			G5	S5B	
Great Egret	<i>Ardea alba</i>		T	G5	S1B	
Great Horned Owl	<i>Bubo virginianus</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Greater Scaup	<i>Aythya marila</i>			G5	SNA	
Greater Shearwater	<i>Puffinus gravis</i>			G5		
Greater White-fronted Goose	<i>Anser albifrons</i>			G5	SNAN	
Greater Yellowlegs	<i>Tringa melanoleuca</i>			G5	SNA	
Green Heron	<i>Butorides virescens</i>			G5	S5B	
Green-winged Teal	<i>Anas crecca</i>			G5	SNAB	
Gull-billed Tern	<i>Sterna nilotica</i>			G5	SNAN	
Gyrfalcon	<i>Falco rusticolus</i>			G5	SNAN	
Hairy Woodpecker	<i>Picoides villosus</i>			G5	S5	
Harlequin Duck	<i>Histrionicus histrionicus</i>			G4	SNAN	
Henslow's Sparrow	<i>Ammodramus henslowii</i>			G4	SHB,SHN	
Hermit Thrush	<i>Catharus guttatus</i>			G5	S5B	
Herring Gull	<i>Larus argentatus</i>			G5	S5	
Hoary Redpoll	<i>Carduelis hornemanni</i>			G5	SNAN	
Hooded Merganser	<i>Lophodytes cucullatus</i>			G5	S3B	
Hooded Warbler	<i>Wilsonia citrina</i>			G5	S4B	
Horned Grebe	<i>Podiceps auritus</i>			G5	SNA	
Horned Lark	<i>Eremophila alpestris</i>		E	G5	S1B	
House Finch	<i>Carpodacus mexicanus</i>			G5	SNA	
House Sparrow	<i>Passer domesticus</i>			G5	SNA	
House Wren	<i>Troglodytes aedon</i>			G5	S5B	
Hudsonian Godwit	<i>Limosa haemastica</i>			G4	SNA	
Iceland Gull	<i>Larus glaucoides</i>			G5	SNA	
Indigo Bunting	<i>Passerina cyanea</i>			G5	S5B	
Ipswich Sparrow	<i>Passerculus sandwichensis</i>		SC	G5T2	S1N	
Kentucky Warbler	<i>Oporornis formosus</i>			G5	S3B	
Killdeer	<i>Charadrius vociferus</i>			G5	S4B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
King Eider	<i>Somateria spectabilis</i>			G5	SNA	
King Rail	<i>Rallus elegans</i>		E	G4G5	S1B	
Labrador Duck	<i>Camptorhynchus labradorius</i>			GX	SX	
Lark Sparrow	<i>Chondestes grammacus</i>			G5	SNAN	
Laughing Gull	<i>Larus atricilla</i>			G5	SNA	
Leach's Storm-petrel	<i>Oceanodroma leucorhoa</i>			G5		
Least Bittern	<i>Ixobrychus exilis</i>		T	G5	S2B	
Least Flycatcher	<i>Empidonax minimus</i>			G5	S5B	
Least Sandpiper	<i>Calidris minutilla</i>			G5	SNA	
Least Tern	<i>Sterna antillarum</i>		T	G4	S2B	X
Lesser Black-backed Gull	<i>Larus fuscus</i>			G5	SNA	
Lesser Scaup	<i>Aythya affinis</i>			G5	SNA	
Lesser Yellowlegs	<i>Tringa flavipes</i>			G5	SNA	
Lincoln's Sparrow	<i>Melospiza lincolnii</i>			G5	SNA	
Little Blue Heron	<i>Egretta caerulea</i>		SC	G5	S1B	
Little Gull	<i>Larus minutus</i>			G5	SNA	
Loggerhead Shrike	<i>Lanius ludovicianus</i>			G4T3Q	SXN	
Long-billed Curlew	<i>Numenius americanus</i>			G5		
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>			G5	SNA	
Long-eared Owl	<i>Asio otus</i>		E	G5	S1B	X
Long-tailed Duck	<i>Clangula hyemalis</i>			G5	SNA	
Louisiana Waterthrush	<i>Seiurus motacilla</i>			G5	S5B	X
Magnolia Warbler	<i>Dendroica magnolia</i>			G5	S4B	
Mallard	<i>Anas platyrhynchos</i>			G5	SNA	
Manx Shearwater	<i>Puffinus puffinus</i>			G5		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Marbled Godwit	<i>Limosa fedoa</i>			G5	SNA	
Marsh Wren	<i>Cistothorus palustris</i>			G5	S3B	
Merlin	<i>Falco columbarius</i>			G5	SNA	
Mississippi Kite	<i>Ictinia mississippiensis</i>			G5		
Monk Parakeet	<i>Myiopsitta monachus</i>			G5	SNA	
Mourning Dove	<i>Zenaida macroura</i>			G5	S5	
Mourning Warbler	<i>Oporornis philadelphia</i>			G5	SNA	
Mute Swan	<i>Cygnus olor</i>			G5	SNA	
Nashville Warbler	<i>Vermivora ruficapilla</i>			G5	S4B	
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>			G5	SNR	
Northern Bobwhite	<i>Colinus virginianus</i>			G5	S4	
Northern Cardinal	<i>Cardinalis cardinalis</i>			G5	S5	
Northern Flicker	<i>Colaptes auratus</i>			G5	S5	
Northern Gannet	<i>Morus bassanus</i>			G5	SNAN	
Northern Goshawk	<i>Accipiter gentilis</i>			G5	S4B	
Northern Harrier	<i>Circus cyaneus</i>		E	G5	S1B	X
Northern Mockingbird	<i>Mimus polyglottos</i>			G5	S5	
Northern Parula	<i>Parula americana</i>		SC	G5	S1B	
Northern Pintail	<i>Anas acuta</i>			G5	SNA	
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>			G5	S5B	
Northern Saw-whet Owl	<i>Aegolius acadicus</i>		SC	G5	S2B	
Northern Shoveler	<i>Anas clypeata</i>			G5	SNA	
Northern Shrike	<i>Lanius excubitor</i>			G5	SNAN	
Northern Waterthrush	<i>Seiurus noveboracensis</i>			G5	S5B	
Northern Wheatear	<i>Oenanthe oenanthe</i>			G5	SNAN	
Olive-sided Flycatcher	<i>Contopus borealis</i>			G4	S2B	
Orange-crowned Warbler	<i>Vermivora celata</i>			G5	SNA	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Orchard Oriole	<i>Icterus spurius</i>			G5	S5B	
Osprey	<i>Pandion haliaetus</i>			G5	S3B	
Ovenbird	<i>Seiurus aurocapillus</i>			G5	S5B	
Palm Warbler	<i>Dendroica palmarum</i>			G5	SNA	
Pectoral Sandpiper	<i>Calidris melanotos</i>			G5	SNA	
Peregrine Falcon	<i>Falco peregrinus</i>		E	G4	S1B	
Philadelphia Vireo	<i>Vireo philadelphicus</i>			G5	SNA	
Pied-billed Grebe	<i>Podilymbus podiceps</i>		E	G5	S1B	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>			G5	S5	
Pine Grosbeak	<i>Pinicola enucleator</i>			G5	SNA	
Pine Siskin	<i>Carduelis pinus</i>			G5	SNAB	
Pine Warbler	<i>Dendroica pinus</i>			G5	S4B	
Piping Plover	<i>Charadrius melodus</i>	T	T	G3	S1B	
Prairie Warbler	<i>Dendroica discolor</i>			G5	S5B	
Prothonotary Warbler	<i>Protonotaria citrea</i>			G5	SNAB	
Purple Finch	<i>Carpodacus purpureus</i>			G5	S4B	
Purple Martin	<i>Progne subis</i>		T	G5	S1B	
Purple Sandpiper	<i>Calidris maritima</i>			G5	SNA	
Red Crossbill	<i>Loxia curvirostra</i>			G5	SNA	
Red Knot	<i>Calidris canutus</i>			G5	SNA	
Red Phalarope	<i>Phalaropus fulicarius</i>			G5	SNAN	
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>			G5	S4	
Red-breasted Merganser	<i>Mergus serrator</i>			G5	SNAB	
Red-breasted Nuthatch	<i>Sitta canadensis</i>			G5	S5	
Red-eyed Vireo	<i>Vireo olivaceus</i>			G5	S5B	
Redhead	<i>Aythya americana</i>			G5	SNA	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>		E	G5	S1	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Red-necked Grebe	<i>Podiceps grisegena</i>			G5	SNA	
Red-necked Phalarope	<i>Phalaropus lobatus</i>			G4G5	SNAN	
Red-shouldered Hawk	<i>Buteo lineatus</i>			G5	S3B	
Red-tailed Hawk	<i>Buteo jamaicensis</i>			G5	S5	
Red-throated Loon	<i>Gavia stellata</i>			G5	SNA	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			G5	S5B	
Ring-billed Gull	<i>Larus delawarensis</i>			G5	SNA	
Ring-necked Duck	<i>Aythya collaris</i>			G5	SNA	
Ring-necked Pheasant	<i>Phasianus colchicus</i>			G5	SNA	
Rock Dove	<i>Columba livia</i>			G5	SNA	
Roseate Tern	<i>Sterna dougallii</i>	E	E	G4	S1B	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			G5	S5B	
Rough-legged Hawk	<i>Buteo lagopus</i>			G5	SNA	
Royal Tern	<i>Sterna maxima</i>			G5	SNA	
Ruby-crowned Kinglet	<i>Regulus calendula</i>			G5	SNA	
Ruby-throated Hummingbird	<i>Archilochus colubris</i>			G5	S5B	
Ruddy Duck	<i>Oxyura jamaicensis</i>			G5	SNA	
Ruddy Turnstone	<i>Arenaria interpres</i>			G5	SNA	
Ruff	<i>Philomachus pugnax</i>			G5	SNAN	
Ruffed Grouse	<i>Bonasa umbellus</i>			G5	S5	
Rufous Hummingbird	<i>Selasphorus rufus</i>			G5		
Rusty Blackbird	<i>Euphagus carolinus</i>			G5	SNA	
Saltmarsh Sharp-tailed Sparrow	<i>Ammodramus caudacutus</i>		SC	G4	S3B	X
Sanderling	<i>Calidris alba</i>			G5	SNA	
Sandhill Crane	<i>Grus canadensis</i>			G5		
Sandwich Tern	<i>Sterna sandvicensis</i>			G5		
Savannah Sparrow	<i>Passerculus sandwichensis</i>		SC	G5	S3B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Scarlet Tanager	<i>Piranga olivacea</i>			G5	S5B	
Seaside Sparrow	<i>Ammodramus maritimus</i>		SC	G4	S3B	
Sedge Wren	<i>Cistothorus platensis</i>		E	G5	S1B	X
Semipalmated Plover	<i>Charadrius semipalmatus</i>			G5	SNA	
Semipalmated Sandpiper	<i>Calidris pusilla</i>			G5	SNA	
Sharp-shinned Hawk	<i>Accipiter striatus</i>		E	G5	S2B	
Short-billed Dowitcher	<i>Limnodromus griseus</i>			G5	SNA	
Short-eared Owl	<i>Asio flammeus</i>		T	G5	SHB,S1N	X
Snow Bunting	<i>Plectrophenax nivalis</i>			G5	SNA	
Snow Goose	<i>Chen caerulescens</i>			G5	SNA	
Snowy Egret	<i>Egretta thula</i>		T	G5	S1B	
Snowy Owl	<i>Nyctea scandiaca</i>			G5	SNA	
Solitary Sandpiper	<i>Tringa solitaria</i>			G5	SNA	
Song Sparrow	<i>Melospiza melodia</i>			G5	S5B	
Sooty Tern	<i>Sterna fuscata</i>			G5		
Sora	<i>Porzana carolina</i>			G5	S2B	
Spotted Sandpiper	<i>Actitis macularia</i>			G5	S5B	
Stilt Sandpiper	<i>Calidris himantopus</i>			G5	SNA	
Summer Tanager	<i>Piranga rubra</i>			G5	SNAN	
Surf Scoter	<i>Melanitta perspicillata</i>			G5	SNA	
Swainson's Thrush	<i>Catharus ustulatus</i>			G5	SNA	
Swallow-tailed Kite	<i>Elanoides forficatus</i>			G5		
Swamp Sparrow	<i>Melospiza georgiana</i>			G5	S5B	
Tennessee Warbler	<i>Vermivora peregrina</i>			G5	SNA	
Thick-billed Murre	<i>Uria lomvia</i>			G5	SNAN	
Tree Swallow	<i>Tachycineta bicolor</i>			G5	S5B	
Tricolored Heron	<i>Egretta tricolor</i>			G5	S1B	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Tufted Titmouse	<i>Baeolophus bicolor</i>			G5	S5	
Tundra Swan	<i>Cygnus columbianus</i>			G5	SNAN	
Turkey Vulture	<i>Cathartes aura</i>			G5	S5B	
Upland Sandpiper	<i>Bartramia longicauda</i>		E	G5	S1B	X
Varied Thrush	<i>Ixoreus naevius</i>			G5	SNAN	
Veery	<i>Catharus fuscescens</i>			G5	S5B	
Vesper Sparrow	<i>Pooecetes gramineus</i>		E	G5	S1B	
Virginia Rail	<i>Rallus limicola</i>			G5	S3B	
Warbling Vireo	<i>Vireo gilvus</i>			G5	S5B	
Western Kingbird	<i>Tyrannus verticalis</i>			G5	SNA	
Western Sandpiper	<i>Calidris mauri</i>			G5	SNA	
Whimbrel	<i>Numenius phaeopus</i>			G5	SNA	
Whip-poor-will	<i>Caprimulgus vociferus</i>		SC	G5	S3B	X
White-breasted Nuthatch	<i>Sitta carolinensis</i>			G5	S5	
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>			G5	SNA	
White-eyed Vireo	<i>Vireo griseus</i>			G5	S5B	
White-rumped Sandpiper	<i>Calidris fuscicollis</i>			G5	SNA	
White-throated Sparrow	<i>Zonotrichia albicollis</i>			G5	S5B, S5N	
White-winged Crossbill	<i>Loxia leucoptera</i>			G5	SNAB	
White-winged Scoter	<i>Melanitta fusca</i>			G5	SNA	
Wild Turkey	<i>Meleagris gallopavo</i>			G5	S5	
Willet	<i>Catoptrophorus semipalmatus</i>			G5	S2B	
Willow Flycatcher	<i>Empidonax traillii</i>			G5	S5B	
Wilson's Phalarope	<i>Phalaropus tricolor</i>			G5	SNAN	
Wilson's Plover	<i>Charadrius wilsonia</i>			G5		
Wilson's Snipe	<i>Gallinago delicata</i>			G5	SNAB	
Wilson's Storm-petrel	<i>Oceanites oceanicus</i>			G5		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Wilson's Warbler	<i>Wilsonia pusilla</i>			G5	SNA	
Winter Wren	<i>Troglodytes troglodytes</i>			G5	S5B	
Wood Duck	<i>Aix sponsa</i>			G5	S4B	
Wood Thrush	<i>Hylocichla mustelina</i>			G5	S5B	
Worm-eating Warbler	<i>Helmitheros vermivorus</i>			G5	S5B	
Yellow Rail	<i>Coturnicops noveboracensis</i>			G4	SNAN	
Yellow Warbler	<i>Dendroica petechia</i>			G5	S5B	
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>			G5	SNA	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			G5	S4B	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>			G5	S5B	
Yellow-breasted Chat	<i>Icteria virens</i>		E	G5	S1B	
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>		SC	G5	S1B	
Yellow-rumped Warbler	<i>Dendroica coronata</i>			G5	S4B	
Yellow-throated Vireo	<i>Vireo flavifrons</i>			G5	S5B	
Yellow-throated Warbler	<i>Dendroica dominica</i>			G5	SNAN	
Amphibians/Reptiles						
American Bullfrog	<i>Rana catesbeiana</i>			G5	S5	
American Toad	<i>Bufo americanus</i>			G5	S5	
Blue-spotted Salamander (complex)	<i>Ambystoma laterale</i>		SC	G5	S1	X
Blue-spotted Salamander (diploid)	<i>Ambystoma laterale</i>		T	G5	S1	X
Bog Turtle	<i>Glyptemys muhlenbergii</i>	T	E	G3	S1	
Common Five-lined Skink	<i>Eumeces fasciatus</i>		T	G5	S1	
Common Gartersnake	<i>Thamnophis sirtalis</i>			G5	S5	
Copperhead	<i>Agkistrodon contortrix</i>			G5	S3	
Dekay's Brown Snake	<i>Storeria dekayi</i>			G5	S5	
Diamond-backed Terrapin	<i>Malaclemys terrapin</i>			G4	S3	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Eastern Box Turtle	<i>Terrapene carolina</i>		SC	G5	S4	X
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>		SC	G5	S3S4	X
Eastern Newt	<i>Notophthalmus viridescens</i>			G5	S5	
Eastern Racer	<i>Coluber constrictor</i>			G5	S5	
Eastern Rat Snake	<i>Elaphe alleghaniensis</i>			G5	S4	
Eastern Red-backed Salamander	<i>Plethodon cinereus</i>			G5	S5	
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>		SC	G5	S3S4	X
Eastern Spadefoot	<i>Scaphiopus holbrookii</i>		E	G5	S1	X
Eastern Wormsnake	<i>Carphophis amoenus</i>			G5	S4	
Four-toed Salamander	<i>Hemidactylium scutatum</i>			G5	S4	
Fowler's Toad	<i>Bufo fowleri</i>			G5	S4	
Gray Treefrog	<i>Hyla versicolor</i>			G5	S5	
Green Frog	<i>Rana clamitans</i>			G5	S5	
Green Seaturtle	<i>Chelonia mydas</i>	T	T	G3	SNA	
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>		SC	G4	S3	X
Kemp's Ridley Seaturtle	<i>Lepidochelys kempii</i>	E	E	G1	SNA	
Leatherback Seaturtle	<i>Dermochelys coriacea</i>	E	E	G2	SNA	
Loggerhead Seaturtle	<i>Caretta caretta</i>	T	T	G3	SNA	
Marbled Salamander	<i>Ambystoma opacum</i>			G5	S4	
Milk Snake	<i>Lampropeltis triangulum</i>			G5	S5	
Mudpuppies	<i>Necturus maculosus</i>			G5	SNR	
Northern Dusky Salamander	<i>Desmognathus fuscus</i>			G5	S4	
Northern Leopard Frog	<i>Rana pipiens</i>		SC	G5	S2	X
Northern Slimy Salamander	<i>Plethodon glutinosus</i>		T	G5	S2	
Northern Spring Salamander	<i>Gyrinophilus porphyriticus</i>		T	G5	S2	
Northern Two-lined Salamander	<i>Eurycea bislineata</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Northern Watersnake	<i>Nerodia sipedon</i>			G5	S5	
Painted Turtle	<i>Chrysemys picta</i>			G5	S5	
Pickerel Frog	<i>Rana palustris</i>			G5	S5	
Red-bellied Snake	<i>Storeria occipitomaculata</i>			G5	S4	
Ring-necked Snake	<i>Diadophis punctatus</i>			G5	S5	
Smooth Greensnake	<i>Opheodrys vernalis</i>			G5	S3S4	
Snapping Turtle	<i>Chelydra serpentina</i>			G5	S5	
Spotted Salamander	<i>Ambystoma maculatum</i>			G5	S5	
Spotted Turtle	<i>Clemmys guttata</i>			G5	S4	X
Spring Peeper	<i>Pseudacris crucifer</i>			G5	S5	
Stinkpot	<i>Sternotherus odoratus</i>			G5	S4	
Timber Rattlesnake	<i>Crotalus horridus</i>		E	G4	S1	X
Wood Frog	<i>Rana sylvatica</i>			G5	S4	
Wood Turtle	<i>Glyptemys insculpta</i>		SC	G4	S3	X
Fish						
African Pompano	<i>Alectis ciliaris</i>					
Alewife	<i>Alosa pseudoharengus</i>			G5	S3	
American Brook Lamprey	<i>Lampetra appendix</i>		E	G4	S1	X
American Eel	<i>Anguilla rostrata</i>			G5	S5	
American Shad	<i>Alosa sapidissima</i>			G5	S3	
Atlantic Bonito	<i>Sarda sarda</i>			GNR		
Atlantic Chub Mackerel	<i>Scomber colias</i>					
Atlantic Cod	<i>Gadus morhua</i>			G5		
Atlantic Croaker	<i>Micropogonias undulatus</i>			G5		
Atlantic Cutlassfish	<i>Trichiurus lepturus</i>			G5		
Atlantic Herring	<i>Clupea harengus</i>			GNR		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Atlantic Mackerel	<i>Scomber scombrus</i>			G5		
Atlantic Salmon	<i>Salmo salar</i>			G5	SH	
Atlantic Silversides	<i>Menidia menidia</i>					
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>		T	G3	S1	X
Atlantic Tomcod	<i>Microgadus tomcod</i>			GNR	SNR	
Banded Gunnel	<i>Pholis fasciata</i>					
Banded Killifish	<i>Fundulus diaphanus</i>			G5	S4	
Banded Rudderfish	<i>Seriola zonata</i>					
Banded Sunfish	<i>Enneacanthus obesus</i>		SC	G5	S3	X
Barndoor Skate	<i>Dipturus laevis</i>			G3		
Bay Anchovy	<i>Anchoa mitchilli</i>			G5		
Bigeye	<i>Priacanthus arenatus</i>					
Bigeye Scad	<i>Selar crumenophthalmus</i>					
Black Bullhead	<i>Ameiurus melas</i>			G5	SNA	
Black Crappie	<i>Pomoxis nigromaculatus</i>			G5		
Black Sea Bass	<i>Centropristes striata</i>			GNR		
Blacknose Dace	<i>Rhinichthys atratulus</i>			G5		
Blackspotted Stickleback	<i>Gasterosteis wheatlandi</i>			G5		
Blue Shark	<i>Prionace glauca</i>			GNR		
Blueback Herring	<i>Alosa aestivalis</i>			G5	S5	
Bluefish	<i>Pomatomus saltatrix</i>			G5		
Bluegill	<i>Lepomis macrochirus</i>			G5	SNA	
Bluespotted Cornetfish	<i>Fistularia tabacaria</i>			GNR		
Bluntnose Minnow	<i>Pimephales notatus</i>			G5	S1	
Bonefish	<i>Albula vulpes</i>					
Bowfin	<i>Amia calva</i>			G5	SNA	
Bridle Shiner	<i>Notropis bifrenatus</i>			G5	S3	X
Brook Trout (wild)	<i>Salvelinus fontinalis</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Brown Bullhead	<i>Ameiurus nebulosus</i>			G5	S5	
Brown Trout (wild)	<i>Salmo trutta</i>			G5	SNA	
Burbot	<i>Lota lota</i>		E	G5	S1	
Butterfish	<i>Peprilus triacanthus</i>			GNR		
Central Mudminnow	<i>Umbria limi</i>			G5	SNA	
Chain Pickerel	<i>Esox niger</i>			G5	S5	
Channel Catfish	<i>Ictalurus punctatus</i>			G5	SNA	
Clearnose Skate	<i>Raja eglanteria</i>					
Common Carp	<i>Cyprinus carpio</i>			G5	SNA	
Common Shiner	<i>Luxilus cornutus</i>			G5		
Conger Eel	<i>Conger oceanicus</i>			GNR		
Creek Chub	<i>Semotilus atromaculatus</i>			G5	S5	
Creek Chubsucker	<i>Erimyzon oblongus</i>			G5	S3	
Crevalle Jack	<i>Caranx hippos</i>			G5		
Cunner	<i>Tautoglabrus adspersus</i>			G5		
Cutlips Minnow	<i>Exoglossum maxillingua</i>			G5		
Dwarf Goatfish	<i>Upeneus parvus</i>					
Fallfish	<i>Semotilus corporalis</i>			G5		
Fathead Minnow	<i>Pimephales promelas</i>			G5	SNA	
Fawn Cusk-eel	<i>Lepophidium profundorum</i>					
Fourbeard Rockling	<i>Enchelyopus cimbrius</i>			GNR		
Foureye Butterflyfish	<i>Chaetodon capistratus</i>					
Fourspine Stickleback	<i>Apeltes quadracus</i>			G5	S3	
Fourspot Flounder	<i>Paralichthys oblongus</i>					
Gizzard Shad	<i>Dorsoma cepedianum</i>			G5	SNA	
Glasseye Snapper	<i>Priacanthus cruentatus</i>					
Golden Shiner	<i>Notemigonus crysoleucas</i>			G5		
Goldfish	<i>Carassius auratus</i>			G5	SNA	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Goosefish	<i>Lophius americanus</i>			G5		
Grass Carp	<i>Ctenopharyngodon idella</i>			G5		
Gray Triggerfish	<i>Balistes capriscus</i>					
Green Sunfish	<i>Lepomis cyanellus</i>			G5	SNA	
Grubby	<i>Myoxocephalus aeneus</i>			G5		
Haddock	<i>Melanogrammus aeglefinus</i>			GNR		
Hickory Shad	<i>Alosa mediocris</i>			G5	S2	
Hogchoker	<i>Trinectes maculatus</i>			G5		
Inland Silverside	<i>Menidia beryllina</i>			G5		
Kokanee Salmon	<i>Onchorhynchus nerka</i>	PS		G5		
Largemouth Bass	<i>Micropterus salmoides</i>			G5		
Lined Seahorse	<i>Hippocampus erectus</i>			GNR		
Little Skate	<i>Leucoraja erinacea</i>			GNR		
Longhorn Sculpin	<i>Myoxocephalus</i>			G5		
Longnose Dace	<i>Rhinichthys cataractae</i>			G5		
Longnose Sucker	<i>Catostomus catostomus</i>		SC	G5	SNR	
Lookdown	<i>Selene vomer</i>			G5		
Lumpfish	<i>Cyclopterus lumpus</i>			GNR		
Mackerel Scad	<i>Decapterus macarellus</i>					
Menhaden	<i>Brevoortia tyrannus</i>			G5		
Mimic Shiner	<i>Notropis volucellus</i>			G5		
Moonfish	<i>Selene setapinnis</i>			G5		
Mummichog	<i>Fundulus heteroclitus</i>			G5	S5	
Naked Goby	<i>Gobiosoma boscii</i>			G5		
Ninespine Stickleback	<i>Pungitius pungitius</i>			G5	S3	
Northern Kingfish	<i>Menticirrhus saxatilis</i>			GNR		
Northern Pike	<i>Esox lucius</i>			G5	SNA	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Northern Puffer	<i>Sphoeroides maculatus</i>			G5		
Northern Seabrook	<i>Prionotus carolinus</i>			G5		
Northern Sennet	<i>Sphyræna borealis</i>					
Nurse Shark	<i>Ginglymostoma cirratum</i>					
Ocean Pout	<i>Macrozoarces americanus</i>			GNR		
Ocean Sunfish	<i>Mola mola</i>			GNR		
Orange Filefish	<i>Aluterus schoepfi</i>			G5		
Oyster Toadfish	<i>Opsanus tau</i>			GNR		
Pipefish	<i>Syngnathus fuscus</i>			G5		
Planehead Filefish	<i>Monacanthus hispidus</i>					
Pollock	<i>Pollachius virens</i>			GNR		
Pumpkinseed	<i>Lepomis gibbosus</i>			G5		
Radiated Shanny	<i>Ulvaria subbifurcata</i>			GNR		
Rainbow Smelt	<i>Osmerus mordax</i>		T	G5	S1	
Rainbow Trout	<i>Oncorhynchus mykiss</i>	PS		G5	SNA	
Red Cornetfish	<i>Fistularia petimba</i>					
Red Goatfish	<i>Mullus auratus</i>					
Red Hake	<i>Urophycis chuss</i>			GNR		
Redbreast Sunfish	<i>Lepomis auritus</i>			G5		
Redfin Pickerel	<i>Esox americanus</i>			G5	S4	
Rock Bass	<i>Ambloplites rupestris</i>			G5	SNA	
Rock Gunnel	<i>Pholis gunnellus</i>			GNR		
Rough Scad	<i>Trachurus lathami</i>					
Roughtail Stingray	<i>Dasyatis centroura</i>					
Round Herring	<i>Etrumeus teres</i>			GNR		
Round Scad	<i>Decapterus punctatus</i>					
Sand Lance	<i>Ammodytes americanus</i>			G5		
Sandbar Shark	<i>Carcharhinus plumbeus</i>					

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Sandtiger Shark	<i>Odontaspis taurus</i>		SC	G3G4		
Scup	<i>Stenotomus chrysops</i>			GNR		
Sea Lamprey	<i>Petromyzon marinus</i>			G5	S5	
Sea Raven	<i>Hemitripterus americanus</i>			GNR		
Seasnail	<i>Liparis atlanticus</i>			G5		
Sharksucker	<i>Echeneis naucrates</i>			GNR		
Sheepshead Minnow	<i>Cyprinodon variegatus</i>			G5		
Short Bigeye	<i>Pristigenys alta</i>					
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	E	E	G3	S1	
Silver Hake	<i>Merluccius bilinearis</i>			GNR		
Slimy Sculpin	<i>Cottus cognatus</i>			G5	S3	
Smallmouth Bass	<i>Micropterus dolomieu</i>			G5		
Smallmouth Flounder	<i>Etropus microstomus</i>			GNR		
Smooth Dogfish	<i>Mustelis canis</i>					
Smooth Flounder	<i>Pleuronectes putnami</i>			GNR		
Spanish Mackerel	<i>Scomberomorus maculatus</i>			G5		
Spiny Dogfish	<i>Squalus acanthias</i>			GNR		
Spot	<i>Leiostomus xanthurus</i>			G5		
Spotfin Killifish	<i>Fundulus luciae</i>			G4		
Spottail Shiner	<i>Notropis hudsonius</i>			G5	S5	
Spotted Hake	<i>Urophycis regia</i>			GNR		
Striped Anchovy	<i>Anchoa hepsetus</i>			G5		
Striped Bass	<i>Morone saxatilis</i>			G5	S3	
Striped Cusk-eel	<i>Ophidion marginatum</i>			GNR		
Striped Searobin	<i>Prionotus evolans</i>			G5		
Summer Flounder	<i>Paralichthys dentatus</i>			GNR		
Swamp Darter	<i>Etheostoma fusiforme</i>			G5	S2	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Tautog	<i>Tautoga onitis</i>			GNR		
Tench	<i>Tinca tinca</i>			G5		
Tessellated Darter	<i>Etheostoma olmstedi</i>			G5	S5	
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	PS		G5	SNR	
Walleye	<i>Sander vitreus</i>			G5	SNA	
Warsaw Grouper	<i>Epinephelus nigritus</i>	PS		G3	SNR	
Weakfish	<i>Cynoscion regalis</i>			GNR		
White Catfish	<i>Ameiurus catus</i>			G5	SNA	
White Crappie	<i>Pomoxis annularis</i>			G5		
White Hake	<i>Urophycis tenuis</i>			GNR		
White Perch	<i>Morone americana</i>			G5	S5	
White Sucker	<i>Catostomus commersoni</i>			G5		
Windowpane Flounder	<i>Scophthalmus aquosus</i>			G5		
Winter Flounder	<i>Pseudopleuronectes americanus</i>			G5		
Winter Skate	<i>Leucoraja ocellata</i>			GNR		
Yellow Bullhead	<i>Ameiurus natalis</i>			G5	SNA	
Yellow Jack	<i>Caranx bartholomaei</i>					
Yellow Perch	<i>Perca flavescens</i>			G5		
Yellowtail Flounder	<i>Limanda ferruginea</i>					
Invertebrates						
Acadian Hairstreak	<i>Satyrium acadicum</i>			G5	S4	
Acronicta lanceolaria	<i>Acronicta lanceolaria</i>		SCX	G4	SH	
Agonum darlingtoni	<i>Agonum darlingtoni</i>		SC	GNR	SNR	
Agonum mutatum	<i>Agonum mutatum</i>		SC	GNR	SNR	
Alewife Floater	<i>Anodonta implicata</i>			G5	SU	
Amara chalcea	<i>Amara chalcea</i>		SC	GNR	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Amber-winged Spreadwing	<i>Lestes eurinus</i>			G4	S3	
American Burying Beetle	<i>Nicrophorus americanus</i>	E	SCX	G2G3	SX	
American Copper	<i>Lycaena phlaeas</i>			G5	S5	
American Emerald	<i>Cordulia shurtleffi</i>			G5	S3	
American Lobster	<i>Homarus americanus</i>					
American Painted Lady	<i>Vanessa virginiensis</i>			G5	S5	
American Rubyspot	<i>Hetaerina americana</i>		SC	G5	S1	
An Underwing Moth	<i>Catocala</i> sp.			G4G5	SNR	
An Underwing Moth	<i>Catocala muliercula</i>			G5	S1	
An Underwing Moth	<i>Catocala carissima</i>			G5	SNR	
An Underwing Moth	<i>Catocala resecta</i>			G5	SNR	
Andromeda Underwing	<i>Catocala andromedae</i>			G5	SNR	
Angus' Underwing	<i>Catocala angusi</i>			G4	SNR	
Annointed Sallow Moth	<i>Pyreferra ceromatica</i>		SCX	GU	SH	
Apamea burgessi	<i>Apamea burgessi</i>		SC	G4	S1	
Aphrodite Fritillary	<i>Speyeria aphrodite</i>			G5	S5	
Appalachian Blue	<i>Celastrina neglectamajor</i>		T	G4	S1	
Appalachian Eyed Brown	<i>Satyrodes appalachia</i>			G4	S4	
Arctic Skipper	<i>Carterocephalus palaemon</i>			G5	SNR	
Arctic Skipper (Palaeartic subspecies)	<i>Carterocephalus palaemon</i>			G5T5	S1	
Arrow Clubtail	<i>Stylurus spiniceps</i>			G5	S2	
Arrowhead Spiketail	<i>Cordulegaster obliqua</i>			G4	S2	
Ash Borer Moth	<i>Papaipema furcata</i>			G4	SNR	
Ash Gyro	<i>Gyraulus parvus</i>			G5	S5	
Ash Sphinx	<i>Manduca jasminearum</i>			G4	SH	
Ashy Clubtail	<i>Gomphus lividus</i>			G5	S4	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Aster Borer Moth	<i>Papaipema impecuniosa</i>			G5	SNR	
Atlantic Bluet	<i>Enallagma doubledayi</i>		SC	G5	S1	
Atlantic Graphic Moth	<i>Drasteria graphica atlantica</i>			G4T4	SH	
Atlantis Fritillary	<i>Speyeria atlantis</i>		SC	G5	SNA	
Atylotus ohioensis	<i>Atylotus ohioensis</i>		SC	GNR	SNR	
Aureolaria Seed Borer	<i>Rhodoecia aurantiago</i>		SC	G4	S2	
Aurora Damselfly	<i>Chromagrion conditum</i>			G5	S5	
Azure Bluet	<i>Enallagma aspersum</i>			G5	S4	
Badister transversus	<i>Badister transversus</i>		SC	GNR	SNR	
Baetisca lacustris	<i>Baetisca lacustris</i>		SC	G5	SNR	
Baetisca obesa	<i>Baetisca obesa</i>		SC	G5	SNR	
Balsam Metarranthus	<i>Metarranthus amyrisaria</i>			G4	SH	
Baltimore Checkerspot	<i>Euphydryas phaeton</i>			G4	S4	
Banded Bog Skimmer	<i>Williamsonia lintneri</i>		E	G3	S1	
Banded Hairstreak	<i>Satyrium calanus</i>			G5	S5	
Banded Mysterysnail	<i>Viviparus georgianus</i>			G5	SNR	
Banded Pennant	<i>Celithemis fasciata</i>			G5	S2	
Band-winged Meadowhawk	<i>Sympetrum semicinctum</i>			G5	S3	
Barrens Chaetagnella	<i>Chaetagnella tremula</i>			G5	S3	
Barrens Dagger Moth	<i>Acronicta albarufa</i>		SCX	G3G4	SH	
Barrens Itame	<i>Itame sp.</i>		T	G3G4	S1	
Barrens Metarranthus Moth	<i>Metarranthus apiciaria</i>		SCX	GU	SH	
Barrens Xylotype	<i>Xylotype capax</i>			G4	SU	
Bar-winged Skimmer	<i>Libellula axilena</i>			G5	SNA	
Bay Scallop	<i>Argopecten irradians</i>			G5		
Bay Underwing	<i>Catocala badia</i>			G4	SNR	
Beaverpond Baskettail	<i>Epitheca canis</i>			G5	S3	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Beaverpond Clubtail	<i>Gomphus borealis</i>			G4	S2	
Bellmouth Rams-horn	<i>Planorbella campanulata</i>			G5	S4	
Bembidion carinula	<i>Bembidion carinula</i>		SC	G?	SNR	
Bembidion lacunarium	<i>Bembidion lacunarium</i>		SC	GNR	SNR	
Bembidion planum	<i>Bembidion planum</i>		SC	G?	SNR	
Bembidion pseudocautum	<i>Bembidion pseudocautum</i>		SC	GNR	SNR	
Bembidion quadratum	<i>Bembidion quadratum</i>		SC	GNR	S2	
Bembidion semicinctum	<i>Bembidion semicinctum</i>		SC	GNR	SNR	
Bembidion simplex	<i>Bembidion simplex</i>		SC	G?	SNR	
Bembidion tetracolum	<i>Bembidion tetracolum</i>		SC	G?	SNR	
Betrothed Underwing	<i>Catocala innubens</i>			G5	SNR	
Big Bluet	<i>Enallagma durum</i>			G5	S3	
Black Dash	<i>Euphyes conspicuus</i>			G4	S4	
Black Lordithon Rove Beetle	<i>Lordithon niger</i>		SCX	GU	SH	
Black Saddlebags	<i>Tramea lacerata</i>			G5	S4N	
Black Swallowtail	<i>Papilio polyxenes</i>			G5	SNR	
Black-shouldered Spinyleg	<i>Dromogomphus spinosus</i>			G5	S4	
Black-tipped Darner	<i>Aeshna tuberculifera</i>			G4	S4	
Blue Corporal Dragonfly	<i>Ladona deplanata</i>		SC	G5	S1	
Blue Crab	<i>Callinectes sapidus</i>					
Blue Dasher	<i>Pachydiplax longipennis</i>			G5	S5	
Blue Mussel	<i>Mytilus edulis</i>					
Blueberry Gray	<i>Glena cognataria</i>			G4	SH	
Blue-fronted Dancer	<i>Argia apicalis</i>			G5	S3	
Bog Copper	<i>Lycaena epixanthe</i>		SC	G4G5	S2	
Bog Tiger Moth	<i>Grammia speciosa</i>		E	G4G5	S1	
Boreal Bluet	<i>Enallagma boreale</i>			G5	S2	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Boreal Fossaria	<i>Fossaria galbana</i>		SCX	G5	SH	
Boreal Turret Snail	<i>Valvata sincera</i>		SC	G5	S1	
Borer Moth	<i>Papaipema cerina</i>			G4	S3	
Borer Moth	<i>Papaipema rigida</i>			G5	SNR	
Brachinus cyanipennis	<i>Brachinus cyanipennis</i>		SCX	GNR	SH	
Brachinus fumans	<i>Brachinus fumans</i>		SC	G?	SNR	
Brachinus medius	<i>Brachinus medius</i>		SC	G?	SNR	
Brachinus ovipennis	<i>Brachinus ovipennis</i>		SC	G?	SNR	
Brachinus patruelis	<i>Brachinus patruelis</i>		SC	G?	SNR	
Bracken Borer Moth	<i>Papaipema pterisii</i>			G5	SNR	
Bride Underwing	<i>Catocala neogama</i>			G5	SNR	
Briseis Underwing	<i>Catocala briseis</i>			G5	SNR	
Broad-lined Catopyrrha	<i>Catopyrrha coloraria</i>			G4	SH	
Broad-winged Skipper	<i>Poanes viator</i>			G5	SNR	
Broad-winged Skipper (Coastal)	<i>Poanes viator zizaniae</i>			G5T5	S4	
Bronze Copper	<i>Lycaena hyllus</i>		SC	G5	S3	
Brook Floater	<i>Alasmidonta varicosa</i>		E	G3	S1	X
Brook Snaketail	<i>Ophiogomphus aspersus</i>			G3G4	S2	
Brown Elfin	<i>Callophrys augustinus</i>			G5	S4	
Brush-tipped Emerald	<i>Somatochlora walshii</i>			G5	S2	
Buck Moth	<i>Hemileuca maia</i>		EX	G5	S1	
Buckeye	<i>Junonia coenia</i>			G5	SNA	
Bugle Sprite	<i>Micromenetus dilatatus</i>			G5	S5	
Burdock Borer Moth	<i>Papaipema cataphracta</i>			G5	SNR	
Caddisfly	<i>Beraea fontana</i>			GNR	SNR	
Calico Crayfish	<i>Orconectes immunis</i>			G5	SNR	
Calico Pennant	<i>Celithemis elisa</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Calosoma wilcoxi	<i>Calosoma wilcoxi</i>		SCX	GNR	SH	
Canada Darner	<i>Aeshna canadensis</i>			G5	S5	
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>			G5	SNR	
Carabus serratus	<i>Carabus serratus</i>		SCX	GNR	SH	
Carabus sylvosus	<i>Carabus sylvosus</i>		SCX	GNR	SH	
Carabus vinctus	<i>Carabus vinctus</i>		SCX	GNR	SH	
Carolina Saddlebags	<i>Tramea carolina</i>			G5	S3N	
Chaetagnaea cerata	<i>Chaetagnaea cerata</i>		SCX	G3G4	SH	
Chain Dotted Geometer	<i>Cingilia catenaria</i>			G4	SH	
Chalk-fronted Skimmer	<i>Libellula julia</i>			G5	S5	
Channeled Whelk	<i>Busycotypus canaliculatum</i>			GNR		
Charming Underwing	<i>Catocala blandula</i>			G5	SNR	
Checkered Skipper	<i>Pyrgus communis</i>			G5	SNA	
Checkered White	<i>Pontia protodice</i>			G4	SH	
Cherry-faced Meadowhawk	<i>Sympetrum internum</i>			G5	S5	
Chinese Mysterysnail	<i>Cipangopaludina chinensis</i>			G5	SNA	
Cicada	<i>Tibicen auletes</i>		SCX	GNR	SH	
Cicindela dorsalis	<i>Cicindela dorsalis</i>			G4	SU	
Cicindela duodecimguttata	<i>Cicindela duodecimguttata</i>			G5	S3	
Cicindela formosa	<i>Cicindela formosa</i>			G5	SNR	
Cicindela limbalis	<i>Cicindela limbalis</i>			G5	SX	
Cicindela marginata	<i>Cicindela marginata</i>		SC	G5	S1	
Cicindela patruela	<i>Cicindela patruela</i>			G3	SU	
Cicindela punctulata	<i>Cicindela punctulata</i>			G5	S5	
Cicindela purpurea	<i>Cicindela purpurea</i>		SCX	G5	SX	
Cicindela repanda	<i>Cicindela repanda</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Cicindela scutellaris	<i>Cicindela scutellaris</i>			G5	S4	
Cicindela scutellaris rugifrons	<i>Cicindela scutellaris rugifrons</i>			G5T5	SU	
Cicindela sexguttata	<i>Cicindela sexguttata</i>			G5	S5	
Cinygmula subaequalis	<i>Cinygmula subaequalis</i>		SC	G5	SNR	
Citrine Forktail	<i>Ischnura hastata</i>			G5	S3	
Clam Shrimp	<i>Eulimnadia agassizii</i>		SCX	G3G4	SH	
Clamp-tipped Emerald	<i>Somatochlora tenebrosa</i>			G5	S4	
Classification Uncertain	<i>Fossaria exigua</i>			G5	S1	
Clemen's Sphinx	<i>Sphinx luscitiosa</i>			G4	SH	
Cloche Ancyloid	<i>Ferrissia walkeri</i>			G4G5	SU	
Clouded Skipper	<i>Lerema accius</i>			G5	SNA	
Clouded Sulphur	<i>Colias philodice</i>			G5	S5	
Clouded Underwing	<i>Catocala nebulosa</i>			G5	SNR	
Cloudless Sulphur	<i>Phoebis sennae</i>			G5	SNA	
Coastal Barrens Buckmoth	<i>Hemileuca maia maia</i>			G5T5	S1	
Coastal Heathland Cutworm	<i>Abagrotis nefascia benjamini</i>		T	G4T3	S1	
Coastal Mud Shrimp	<i>Upogebia affinis</i>					
Coastal Pond Amphipod	<i>Synurella chamberlaini</i>		SC	GNR	SNR	
Cobra Clubtail	<i>Gomphus vastus</i>		SC	G5	S2	
Cobweb Skipper	<i>Hesperia metea</i>			G4G5	S4	
Columbine Borer	<i>Papaipema leucostigma</i>		SC	G4	S2	
Columbine Duskywing	<i>Erynnis lucilius</i>		E	G4	S1	
Comet Darner	<i>Anax longipes</i>			G5	S1	
Comma	<i>Polygonia comma</i>			G5	S5	
Common Baskettail	<i>Epithea cynosura</i>			G5	S5	
Common Green Darner	<i>Anax junius</i>			G5	S5	
Common Razor Clam	<i>Ensis directus</i>					

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Common Roadside Skipper	<i>Amblyscirtes vialis</i>		T	G5	S1	
Common Sanddragon	<i>Progomphus obscurus</i>		SC	G5	S1	
Common Sootywing	<i>Pholisora catullus</i>			G5	S5	
Common Spreadwing	<i>Lestes disjunctus</i>			G5	S5	
Common Spreadwing	<i>Lestes disjunctus disjunctus</i>			G5T5	S5	
Common Spreadwing (Southern)	<i>Lestes disjunctus australis</i>			G5T5	S1	
Common Whitetail	<i>Libellula lydia</i>			G5	S5	
Common Wood-nymph	<i>Cercyonis pegala</i>			G5	S5	
Compton Tortoiseshell	<i>Nymphalis vaualbum</i>			G5	SNA	
Connubial Underwing	<i>Catocala connubialis</i>			G5	SNR	
Coral Hairstreak	<i>Satyrium titus</i>			G5	S4	
Corporal Skimmer	<i>Libellula exusta</i>			G4	S4	
Crayfish	<i>Cambarus robustus</i>			G5	SNR	
Creeping Ancyloid	<i>Ferrissia rivularis</i>			G5	SNR	
Crimson-ringed Whiteface	<i>Leucorrhinia glacialis</i>		T	G5	S1	
Crossline Skipper	<i>Polites origenes</i>			G5	S4	
Cucullia speyeri	<i>Cucullia speyeri</i>		SCX	G4	SH	
Culvers Root Borer	<i>Papaipema sciata</i>		SCX	G3G4	SH	
Currant Spanworm	<i>Itame ribearia</i>			G4	SH	
Cyrano Darner	<i>Nasiaeschna pentacantha</i>			G5	S3	
Dark-bellied Tiger Beetle	<i>Cicindela tranquebarica</i>		SC	G5	S1	
Darling Underwing	<i>Catocala cara</i>			G5	SNR	
Dejected Underwing	<i>Catocala dejecta</i>			G4	SNR	
Delaware Skipper	<i>Atrytone logan</i>			G5	S5	
Delta-spotted Spiketail	<i>Cordulegaster diastatops</i>			G5	S4	
Disc Gyro	<i>Gyraulus circumstriatus</i>		SC	G5	S1	
Diversity Clam Shrimp	<i>Eulimnadia diversa</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>			G5	S5	
Double-striped Bluet	<i>Enallagma basidens</i>			G5	SNA	
Dragonhunter	<i>Hagenius brevistylus</i>			G5	S3	
Dreamy Duskywing	<i>Erynnis icelus</i>			G5	S5	
Dun Skipper	<i>Euphyes vestris</i>			G5	SNR	
Dun Skipper	<i>Euphyes ruricola metacomet</i>			G5T5	S5	
Dune Ghost Tiger Beetle	<i>Cicindela lepida</i>		E	G4	S1	
Dusky Ancylicid	<i>Laevapex fuscus</i>			G5	S5	
Dusky Clubtail	<i>Gomphus spicatus</i>			G5	S4	
Dusky Dancer	<i>Argia translata</i>			G5	S2	
Dusted Skipper	<i>Atrytonopsis hianna</i>			G4G5	S4	
Dwarf Wedge Mussel	<i>Alasmidonta heterodon</i>	E	E	G1G2	S1	
Eastern Amberwing	<i>Perithemis tenera</i>			G5	S5	
Eastern Elliptio	<i>Elliptio complanata</i>			G5	SU	
Eastern Fairy Shrimp	<i>Eubranchipus holmanii</i>			G5	SNR	
Eastern Floater	<i>Pyganodon cataracta</i>			G5	SU	
Eastern Forktail	<i>Ischnura verticalis</i>			G5	S5	
Eastern Lampmussel	<i>Lampsilis radiata</i>			G5	SU	
Eastern Oyster	<i>Crassostrea virginica</i>			G5		
Eastern Pearlshell	<i>Margaritifera margaritifera</i>		SC	G4	SU	
Eastern Pine Elfyn	<i>Callophrys niphon</i>			G5	S4	
Eastern Pond Mussel	<i>Ligumia nasuta</i>		SC	G4G5	S1	X
Eastern Pondhawk	<i>Erythemis simplicicollis</i>			G5	S5	
Eastern Red Damsel	<i>Amphiagrion saucium</i>			G5	S3	
Eastern Tailed-blue	<i>Everes comyntas</i>			G5	S5	
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>			G5	S5	
Ebony Jewelwing	<i>Calopteryx maculata</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Edwards' Hairstreak	<i>Satyrrium edwardsii</i>			G4	S4	
Elegant Spreadwing	<i>Lestes inaequalis</i>			G5	S4	
Elephant Mosquito	<i>Toxorhynchites rutilus</i>			GNR	SNR	
Elfin Skimmer	<i>Nannothemis bella</i>			G4	S2	
Emerald Spreadwing	<i>Lestes dryas</i>			G5	S3	
Epione Underwing	<i>Catocala epione</i>			G5	SNR	
Eucoptocnemis fimbriaris	<i>Eucoptocnemis fimbriaris</i>		SC	G4	S1	
European Cabbage White	<i>Pieris rapae</i>			G5	SNA	
European Skipper	<i>Thymelicus lineola</i>			G5	SNA	
Euxoa pleuritica	<i>Euxoa pleuritica</i>		SC	G4	SH	
Eyed Brown	<i>Satyrodes eurydice</i>		SC	G4	S2	
Falcate Orangetip	<i>Anthocharis midea</i>			G4G5	S3	
Familiar Bluet	<i>Enallagma civile</i>			G5	S5	
Fawn Darner	<i>Boyeria vinosa</i>			G5	S5	
Fiddler Crabs	<i>Uca spp.</i>					
Fiery Skipper	<i>Hylephila phyleus</i>			G5	SNA	
Flat Claw Hermit Crab	<i>Pagurus pollicaris</i>					
Flexed Gyro	<i>Gyraulus deflectus</i>			G5	S4	
Four-spotted Skimmer	<i>Libellula quadrimaculata</i>			G5	S4	
Fragile Ancyloid	<i>Ferrissia fragilis</i>			G5	S5	
Fragile Forktail	<i>Ischnura posita</i>			G5	S5	
Frosted Elfin	<i>Callophrys irus</i>		T	G3	S2	
Frosted Whiteface	<i>Leucorrhinia frigida</i>			G5	S3	
Furtive Forktail	<i>Ischnura prognata</i>			G4	SU	
Geometer Moth	<i>Epelis truncataria</i>			G5	S2	
Geopinus incrassatus	<i>Geopinus incrassatus</i>		SC	GNR	S1	
Ghost Shrimp	<i>Gilvossius setimanus</i>					
Giant Swallowtail	<i>Papilio cresphontes</i>			G5	SU	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Girlfriend Underwing	<i>Catocala amica</i>			G5	SNR	
Glass Physa	<i>Physa skinneri</i>			G5	SNR	
Golden Fossaria	<i>Fossaria obrussa</i>			G5	SU	
Golden-winged Skimmer	<i>Libellula auripennis</i>			G5	S1	
Goniops chrysocoma	<i>Goniops chrysocoma</i>		SC	GNR	SNR	
Graceful Underwing	<i>Catocala gracilis</i>			G5	SNR	
Graphic Moth	<i>Drasteria graphica</i>			G4	SNR	
Grass Shrimp	<i>Hippolyte spp.</i>					
Grasshopper	<i>Stethophyma celatum</i>			G4	SNR	
Grassland Thaumtopsis	<i>Thaumtopsis edonis</i>		SC	GNR	S1	
Gray Comma	<i>Polygonia progne</i>		SCX	G5	SH	
Gray Hairstreak	<i>Strymon melinus</i>			G5	S5	
Great Ash Sphinx	<i>Sphinx chersis</i>			G4G5	S1	
Great Blue Skimmer	<i>Libellula vibrans</i>			G5	S1N	
Great Spangled Fritillary	<i>Speyeria cybele</i>			G5	S5	
Green Crab	<i>Carcinus maenas</i>					
Green-striped Darner	<i>Aeshna verticalis</i>			G5	S4	
Ground Beetle	<i>Bembidion inaequale</i>			G?	SNR	
Ground Beetle	<i>Loxandrus velocipes</i>			GNR	SNR	
Habilis Underwing	<i>Catocala habilis</i>			G5	SNR	
Hackberry Butterfly	<i>Asterocampa celtis</i>			G5	S3	
Hagen's Bluet	<i>Enallagma hageni</i>			G5	S5	
Hairy-necked Tiger Beetle	<i>Cicindela hirticollis</i>		SC	G5	S1	
Halloween Pennant	<i>Celithemis eponina</i>			G5	S5	
Harlequin Darner	<i>Gomphaeschna furcillata</i>			G5	S4	
Harpalus caliginosus	<i>Harpalus caliginosus</i>		SC	G?	SNR	
Harpalus eraticus	<i>Harpalus eraticus</i>		SC	G?	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Harpoon Clubtail	<i>Gomphus desertus</i>		T	G4	S2	
Harris's Checkerspot	<i>Chlosyne harrisii</i>		T	G4	SNR	
Harvester	<i>Feniseca tarquinius</i>			G4	SU	
Hawthorn Underwing	<i>Catocala crataegi</i>			G5	SNR	
Helluomorphoides praeustus bicolor	<i>Helluomorphoides praeustus</i>		SC	G?	SNR	
Henry's Elfin	<i>Callophrys henrici</i>		SC	G5	S1	
Henscomb Hydrobe	<i>Littoridinops tenuipes</i>			G5	S1	
Heracleum Stem Borer Moth	<i>Papaipema harrisii</i>			G4	SNR	
Herodias Underwing	<i>Catocala herodias gerhardi</i>	E	T	G3T3	S1	
Herodias Underwing	<i>Catocala herodias</i>			G3	S1	
Hessel's Hairstreak	<i>Mitoura hesseli</i>		E	G3G4	S1	
Hickory Hairstreak	<i>Satyrium caryaevorum</i>			G4	S4	
Hoary Edge	<i>Achalarus lyciades</i>			G5	S4	
Hoary Elfin	<i>Callophrys polios</i>		SCX	G5	SH	
Hobomok Skipper	<i>Poanes hobomok</i>			G5	S5	
Hop Vine Borer Moth	<i>Hydraecia immanis</i>		SCX	G4	SH	
Hops-stalk Borer	<i>Papaipema circumlucens</i>		SCX	G4	SH	
Horace's Duskywing	<i>Erynnis horatius</i>		SC	G5	SNR	
Horseshoe Crab	<i>Limulus polyphemus</i>					
Hudsonian Whiteface	<i>Leucorrhinia hudsonica</i>			G5	S2	
Hybomitra frosti	<i>Hybomitra frosti</i>		T	GNR	S1	
Hybomitra fulvicallus	<i>Hybomitra fulvicallus</i>			GNR	SU	
Hybomitra longiglossa	<i>Hybomitra longiglossa</i>		E	GNR	S1	
Hybomitra lurida	<i>Hybomitra lurida</i>		SC	GNR	SU	
Hybomitra trepida	<i>Hybomitra trepida</i>		SC	GNR	SU	
Hybomitra typhus	<i>Hybomitra typhus</i>		SC	GNR	SU	
Ilia Underwing	<i>Catocala ilia</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Illinois River Cruiser	<i>Macromia illinoensis</i>			G5	S4	
Imperial Moth	<i>Eacles imperialis</i>		SCX	G5	SH	
Inconsolable Underwing	<i>Catocala insolabilis</i>			G5	SNR	
Indian Skipper	<i>Hesperia sassacus</i>			G5	S4	
Ironweed Borer Moth	<i>Papaipema cerussata</i>			G5	SNR	
Jane's Meadowhawk	<i>Sympetrum janeae</i>			G5	SNR	
Jonah Crab	<i>Cancer borealis</i>					
Judith' S Underwing	<i>Catocala judith</i>			G5	SNR	
Juvenal's Duskywing	<i>Erynnis juvenalis</i>			G5	S5	
Knobbed Whelk	<i>Busycon carica</i>			GNR		
Labrador Tea Tentiform Leafminer	<i>Phyllonorycter ledella</i>		E	GNR	S1	
Lady Crab	<i>Ovalipes ocellatus</i>					
Lance Aplexa	<i>Aplexa elongata</i>			G5	S2	
Lancet Clubtail	<i>Gomphus exilis</i>			G5	S5	
Lance-tipped Darner	<i>Aeshna constricta</i>			G5	S4	
Least Clubtail	<i>Stylogomphus albistylus</i>			G5	S5	
Least Skipper	<i>Ancyloxypha numitor</i>			G5	S5	
Lemmer's Noctuid Moth	<i>Lithophane lemmeri</i>		SCX	G3G4	SH	
Leonard's Skipper	<i>Hesperia leonardus</i>			G4	S3	
Leptophlebia bradleyi	<i>Leptophlebia bradleyi</i>		SC	G5	SNR	
Liitle Underwing	<i>Catocala minuta</i>			G5	SNR	
Lilypad Clubtail	<i>Arigomphus furcifer</i>			G5	S3	
Lilypad Forktail	<i>Ischnura kellicotti</i>			G5	S3	
Little Bluet	<i>Enallagma minusculum</i>		SC	G3G4	S1	
Little Glassywing	<i>Pompeius verna</i>			G5	S5	
Little Lined Underwing	<i>Catocala lineella</i>			G5	SNR	
Little Nymph Underwing	<i>Catocala micronympha</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Little Sulphur	<i>Eurema lisa</i>			G5	SNA	
Little Wood Satyr	<i>Megisto cymela</i>			G5	S5	
Long Dash	<i>Polites mystic</i>			G5	S4	
Long-finned Squid	<i>Loligo pealeii</i>					
Long-tailed Skipper	<i>Urbanus proteus</i>			G5	SNA	
Loxandrus vitiosus	<i>Loxandrus vitiosus</i>		SC	GNR	SNR	
Lymnaeid Snail	<i>Fossaria rustica</i>		SC	G5	S1	
Lyre-tipped Spreadwing	<i>Lestes unguiculatus</i>			G5	SU	
Mantis Shrimp	<i>Squilla empusa</i>					
Marbled Underwing Moth	<i>Catocala marmorata</i>			G3G4	SH	
Maritime Sunflower Borer	<i>Papaipema maritima</i>		SCX	G4	SH	
Marsh Bluet	<i>Enallagma ebrium</i>			G5	S5	
Marsh Pondsail	<i>Stagnicola elodes</i>			G5	S3	
Marsh Rams-horn	<i>Planorbella trivolvis</i>			G5	S4	
Martha's Pennant	<i>Celithemis martha</i>			G4	S2	
Mayfly	<i>Cloeon cognatum</i>			G3	SNR	
Mayfly	<i>Baetisca laurentina</i>			G5	SNR	
Mayfly	<i>Siphonurus securifer</i>			G2	SNR	
Mayfly	<i>Rhithrogena anomala</i>			G2	SNR	
Meadow Fritillary	<i>Boloria bellona</i>			G5	S5	
Meadow Rue Borer Moth	<i>Papaipema unimoda</i>			G5	SNR	
Merycomyia whitneyi	<i>Merycomyia whitneyi</i>		SC	GNR	SNR	
Meske's Underwing	<i>Catocala meskei</i>			G4	SNR	
Midland Clubtail	<i>Gomphus fraternus</i>		T	G5	S2	
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>			G5	SNA	
Mimic Lymnaea	<i>Pseudosuccinea columella</i>			G5	S5	
Mixogaster johnsoni	<i>Mixogaster johnsoni</i>		SCX	GNR	SH	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Mocha Emerald	<i>Somatochlora linearis</i>			G5	S2	
Monarch	<i>Danaus plexippus</i>			G4	S5	
Moth	<i>Oruza albocastaliata</i>			G4	SU	
Moth	<i>Sthenopis auratus</i>			G3G4	SU	
Mother Underwing	<i>Catocala parta</i>			G5	SNR	
Mottled Darner	<i>Aeshna clepsydra</i>			G4	S3	
Mottled Duskywing	<i>Erynnis martialis</i>		SCX	G3G4	SH	
Mournful Underwing	<i>Catocala flebilis</i>			G5	SNR	
Mourning Cloak	<i>Nymphalis antiopa</i>			G5	S5	
Mud Amnicola	<i>Amnicola limosus</i>			G5	S5	
Mud Crabs	Family Xanthidae					
Mulberry Wing	<i>Poanes massasoit</i>			G4	S4	
Mustached Clubtail	<i>Gomphus adelphus</i>		T	G4	S2	
Myrina Fritillary	<i>Boloria selene myrina</i>			G5T5	S4	
Mystic Valley Amphipod	<i>Crangonyx aberrans</i>		SC	G3	SNR	
Nebria lacustris lacustris	<i>Nebria lacustris lacustris</i>		SC	G?	SNR	
Needham's Skimmer	<i>Libellula needhami</i>			G5	S2	
New England Bluet	<i>Enallagma laterale</i>			G3	S3	
New England Buckmoth	<i>Hemileuca lucina</i>			G4	S1	
New England Siltsnail	<i>Cincinnatia winkleyi</i>			G3	SNR	
New Jersey Tea Inchworm	<i>Apodrepanulatrix liberaria</i>		SC	G4	S1	
Newman's Brocade	<i>Meropleon ambifusca</i>		SC	G3G4	SH	
Noctuid Moth	<i>Platyperigea meralis</i>			G4	S1	
Noctuid Moth	<i>Zale metatoides</i>			G5	SH	
Noctuid Moth	<i>Plusiodonta compressipalpis</i>			G4	SU	
Noctuid Moth	<i>Oligia chlorostigma</i>			G4	SU	
Noctuid Moth	<i>Chytonix sensilis</i>			G4	SU	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Noctuid Moth	<i>Derrima stellata</i>			G4	SU	
Noctuid Moth	<i>Abagrotis magnicupida</i>			G5	SNR	
Noctuid Moth	<i>Abagrotis crumbi</i>			G4	SNR	
Noctuid Moth	<i>Argyrostromis quadrifilaris</i>			G4	S2	
Noctuid Moth	<i>Macrochilo hypocriticalis</i>			G4	S2	
Northeastern Beach Tiger Beetle	<i>Cicindela dorsalis dorsalis</i>	T	SCX	G4T2	SX	
Northern Bluet	<i>Enallagma cyathigerum</i>			G5	S3	
Northern Broken-dash	<i>Wallengrenia egeremet</i>			G5	S5	
Northern Burdock Borer Moth	<i>Papaipema arctivorens</i>			G5	SNR	
Northern Cloudywing	<i>Thorybes pylades</i>			G5	S5	
Northern Hairstreak	<i>Fixsenia ontario</i>			G4T4	SU	
Northern Metalmark	<i>Calephelis borealis</i>		E	G3G4	S1	
Northern Pearly-eye	<i>Enodia anthedon</i>			G5	S5	
Northern Pygmy Clubtail	<i>Lanthus parvulus</i>			G4	SNR	
Oblong Ancyliid	<i>Ferrissia parallelus</i>			G5	S4	
Obscure Underwing	<i>Catocala obscura</i>			G5	SNR	
Ocellated Emerald	<i>Somatochlora minor</i>			G5	SNR	
Oldwife Underwing	<i>Catocala palaeogama</i>			G5	SNR	
Olive Hairstreak	<i>Mitoura grynea</i>			G5	S5	
Omophron tessellatum	<i>Omophron tessellatum</i>		SCX	GNR	SH	
Once-married Underwing	<i>Catocala unijuga</i>			G5	SNR	
Orange Bluet	<i>Enallagma signatum</i>			G5	S5	
Orange Sulphur	<i>Colias eurytheme</i>			G5	S5	
Orange-barred Sulphur	<i>Phoebis philea</i>			G5	SNA	
Osmunda Borer Moth	<i>Papaipema speciosissima</i>			G4	SNR	
Ostrich Fern Borer	<i>Papaipema sp.</i>			G3G4	S2	
Painted Lady	<i>Vanessa cardui</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Painted Skimmer	<i>Libellula semifasciata</i>			G5	S4	
Pale Green Pinion Moth	<i>Lithophane viridipallens</i>		SCX	G4	SH	
Panagaeus fasciatus	<i>Panagaeus fasciatus</i>		SCX	GNR	SH	
Paraleptophlebia assimilis	<i>Paraleptophlebia assimilis</i>		SC	G3	SNR	
Pearl Crescent	<i>Phyciodes tharos</i>			G5	S5	
Peck's Skipper	<i>Polites coras</i>			G5	S5	
Penitent Underwing	<i>Catocala piatrix</i>			G5	SNR	
Pepper and Salt Skipper	<i>Amblyscirtes hegon</i>			G5	SU	
Persius Duskywing	<i>Erynnis persius</i>			G5	S1	
Persius Duskywing	<i>Erynnis persius persius</i>		E	G5T2T3	S1	
Petite Emerald	<i>Dorocordulia lepida</i>			G5	S3	
Pewter Physa	<i>Physella heterostropha</i>			G5	S5	
Phyllira Tiger Moth	<i>Grammia phyllira</i>		SC	G4	SH	
Piedmont Groundwater Amphipod	<i>Stygobromus tenuis</i>			G4	SNR	
Piedmont Groundwater Amphipod	<i>Stygobromus tenuis tenuis</i>		SC	G4G5T2	SNR	
Pine Barrens Tiger Beetle	<i>Cicindela formosa generosa</i>		SC	G5T5	SNR	
Pine Barrens Zale	<i>Zale sp.</i>			G3G4	SU	
Pine Barrens Zanclognatha	<i>Zanclognatha martha</i>		SC	G4	SNR	
Pine Woods Underwing	<i>Catocala sp.</i>			G5	SU	
Pink Sallow	<i>Psectraglaea carnosae</i>		T	G3	S1	
Pink Streak	<i>Faronta rubripennis</i>		T	GNR	SNR	
Pipevine Swallowtail	<i>Battus philenor</i>			G5	SNA	
Pitcher Plant Borer Moth	<i>Papaipema appassioata</i>		E	G4	S1	
Pitcher Plant Moth	<i>Exyra rolandiana</i>		SC	G4	S2	
Plum Sphinx	<i>Sphinx drupiferarum</i>			G4	SH	
Pointed Campeloma	<i>Campeloma decisum</i>			G5	S5	
Polyphemus Moth	<i>Antheraea polyphemus</i>			G5	SU	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Powdered Dancer	<i>Argia moesta</i>			G5	S5	
Praeclara Underwing	<i>Catocala praeclara</i>			G5	SNR	
Prairie Ringlet	<i>Coenonympha tullia</i>			G5	SNA	
Precious Underwing	<i>Catocala pretiosa</i>		SCX	G4	SH	
Precious Underwing (subspecies)	<i>Catocala pretiosa pretiosa</i>			G4T2T3	SX	
Prince Baskettail	<i>Epitheca princeps</i>			G5	S5	
Pumpkin Physa	<i>Physella ancillaria</i>			G5	S3	
Pupa Dusksnail	<i>Lyogyrus pupoideus</i>			G5	S4	
Puritan Tiger Beetle	<i>Cicindela puritana</i>	T	E	G1G2	S1	
Purse-web Spider	<i>Sphodros niger</i>		SC	G4G5	SNR	
Pygmy Fossaria	<i>Fossaria parva</i>			G5	S2	
Question Mark	<i>Polygonia interrogationis</i>			G5	S5	
Racket-tailed Emerald	<i>Dorocordulia libera</i>			G5	S4	
Rambur's Forktail	<i>Ischnura ramburii</i>			G5	S3	
Rapids Clubtail	<i>Gomphus quadricolor</i>		T	G3G4	SH	
Red Admiral	<i>Vanessa atalanta</i>			G5	S5	
Red-bellied Tiger Beetle	<i>Cicindela rufiventris</i>			G5	S2	
Red-waisted Whiteface	<i>Leucorrhinia proxima</i>			G5	S2	
Regal Fritillary	<i>Speyeria idalia</i>		SCX	G3	SX	
Regal Moth	<i>Citheronia regalis</i>		SCX	G5	SH	
Residua Underwing	<i>Catocala residua</i>			G5	SNR	
River Jewelwing	<i>Calopteryx aequabilis</i>			G5	S4	
Riverine Clubtail	<i>Stylurus amnicola</i>		T	G4	S2	
Robinson's Underwing	<i>Catocala robinsoni</i>			G4	SH	
Rock Crab	<i>Cancer irroratus</i>					
Rock Fossaria	<i>Fossaria modicella</i>			G5	SNR	
Ruby Meadowhawk	<i>Sympetrum rubicundulum</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Rusty Crayfish	<i>Orconectes rusticus</i>			G5	SNA	
Rusty Snaketail	<i>Ophiogomphus rupinsulensis</i>			G5	S3	
Saffron-winged Meadowhawk	<i>Sympetrum costiferum</i>			G5	S2	
Salt Marsh Skipper	<i>Panoquina panoquin</i>			G5	SNR	
Saltmarsh Hydrobe	<i>Spurwinkia salsa</i>			GU	SH	
Sand Shrimp	<i>Crangon septemspinosa</i>					
Sargus fasciatus	<i>Sargus fasciatus</i>		SC	GNR	SNR	
Scaphinotus elevatus	<i>Scaphinotus elevatus</i>		SC	GNR	SNR	
Scaphinotus viduus	<i>Scaphinotus viduus</i>		SCX	GNR	SH	
Scarlet Bluet	<i>Enallagma pictum</i>		SC	G3	S1	
Scarlet Underwing	<i>Catocala coccinata</i>			G5	SNR	
Schinia spinosae	<i>Schinia spinosae</i>		SC	G4	SU	
Scribbled Sallow	<i>Lepipolys perscripta</i>		SC	G4	S1	
Scrub Euchlaena	<i>Euchlaena madusaria</i>		SC	G4	SNR	
Seaside Dragonlet	<i>Erythrodiplax berenice</i>			G5	S4	
Seaside Goldenrod Stem Borer	<i>Papaipema duovata</i>		SC	G4	S2	
Sedge Skipper	<i>Euphyes dion</i>		T	G4	S2	
Sedge Sprite	<i>Nehalennia irene</i>			G5	S5	
Sensitive Fern Borer Moth	<i>Papaipema inquaesita</i>			G5	SNR	
Serene Underwing	<i>Catocala serena</i>			G5	SNR	
Seventeen Year Periodical Cicada	<i>Magicicada septendecim</i>			G4	S2	
Shadow Darner	<i>Aeshna umbrosa</i>			G5	S5	
Sharp Sprite	<i>Promenetus exacuus</i>			G5	S5	
Shivering Pinion	<i>Lithophane querequera</i>			G2G4	S1	
Shore Shrimp	<i>Palaemonetes spp.</i>					
Silver-bordered Fritillary	<i>Boloria selene</i>			G5	SNR	
Silver-spotted Skipper	<i>Epargyreus clarus</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Silvery Checkerspot	<i>Chlosyne nycteis</i>		E	G5	S1	
Similar Underwing	<i>Catocala similis</i>			G5	SNR	
Skillet Clubtail	<i>Gomphus ventricosus</i>		SC	G3	S2	
Skimming Bluet	<i>Enallagma geminatum</i>			G5	S5	
Ski-tailed Emerald	<i>Somatochlora elongata</i>		SC	G5	S1	
Slaty Skimmer	<i>Libellula incesta</i>			G5	S5	
Sleepy Dusky Wing	<i>Erynnis brizo brizo</i>			G5T5	S3	
Sleepy Duskywing	<i>Erynnis brizo</i>		T	G5	SNR	
Sleepy Orange	<i>Eurema nicippe</i>			G5	SNA	
Sleepy Underwing or Pink Underwing	<i>Catocala concumbens</i>			G5	SNR	
Slender Bluet	<i>Enallagma traviatum</i>			G5	S2	
Slender Clearwing	<i>Hemaris gracilis</i>		T	G3G4	S1	
Slender Spreadwing	<i>Lestes rectangularis</i>			G5	S5	
Slender Walker	<i>Pomatiopsis lapidaria</i>		SC	G5	S1	
Snout Butterfly	<i>Libytheana carinenta</i>			G5	SNA	
Soft Shell Clam	<i>Mya arenaria</i>					
Sordid Underwing	<i>Catocala sordida</i>			G5	SNR	
South Jersey Caripeta	<i>Caripeta sp.</i>			G4	S1	
Southern Cloudywing	<i>Thorybes bathyllus</i>			G5	S4	
Southern Hairstreak	<i>Fixsenia favonius</i>			G4	SNR	
Southern Pygmy Clubtail	<i>Lanthus vernalis</i>			G4	S2	
Spangled Skimmer	<i>Libellula cyanea</i>			G5	S5	
Sparkling Jewelwing	<i>Calopteryx dimidiata</i>		SC	G5	S1	
Spartina Borer Moth	<i>Spartiniphaga inops</i>		SC	G3G4	SNR	
Spatterdock Darner	<i>Aeshna mutata</i>			G3G4	S2	
Sphagnum Sprite	<i>Nehalennia gracilis</i>			G5	S4	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Spicebush Swallowtail	<i>Papilio troilus</i>			G5	S5	
Spider Crab	<i>Libinia emarginata</i>					
Spine-crowned Clubtail	<i>Gomphus abbreviatus</i>			G3G4	S2	
Spiny Baskettail	<i>Epitheca spinigera</i>			G5	S1	
Spiny Oakworm	<i>Anisota stigma</i>			G5	SH	
Spinycheek Crayfish	<i>Orconectes limosus</i>			G4G5	SNR	
Spongillafly	<i>Sisyra fuscata</i>		SC	GNR	SU	
Spotted Dart	<i>Agrotis stigmosa</i>		SCX	G4	SH	
Spotted Spreadwing	<i>Lestes congener</i>			G5	S5	
Spot-winged Glider	<i>Pantala hymenaea</i>			G5	S4N	
Spring Azure	<i>Celastrina argiolus</i>			G5	S5	
Springtime Darner	<i>Basiaeschna janata</i>			G5	S5	
Springtime Fairy Shrimp	<i>Eubbranchipus vernalis</i>			G4	SNR	
Springtime Physa	<i>Physa vernalis</i>			G3G5	SU	
Squat Dusksnail	<i>Lyogyrus granum</i>			G5	S4	
Squawfoot	<i>Strophitus undulatus</i>			G5	SU	
Stalk Borer Moth	<i>Papaipema nebris</i>			G5	SNR	
Starfish spp.	<i>Asteriid spp.</i>					
Stonefly	<i>Ostrocerca complexa</i>			G4	SNR	
Stonefly	<i>Perlesta nitida</i>			G3G4	SNR	
Stonemyia isabellina	<i>Stonemyia isabellina</i>		SC	GNR	SNR	
Stream Bluet	<i>Enallagma exsulans</i>			G5	S5	
Stream Cruiser	<i>Didymops transversa</i>			G5	S5	
Striped Hairstreak	<i>Satyrium liparops</i>			G5	SNR	
Striped Hairstreak	<i>Satyrium liparops strigosum</i>			G5T5	S5	
Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>			G5	S2	
Summer Azure	<i>Celastrina neglecta</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Sunflower Borer Moth	<i>Papaipema necopina</i>			G4?	SNR	
Superb Jewelwing	<i>Calopteryx amata</i>			G4	S2	
Swamp Darner	<i>Epiaeschna heros</i>			G5	S3	
Swamp Spreadwing	<i>Lestes vigilax</i>			G5	S4	
Swarthy Skipper	<i>Nastra lherminier</i>			G5	SNA	
Sweetfern Underwing	<i>Catocala antinympha</i>			G5	SNR	
Sweetflag Spreadwing	<i>Lestes forcipatus</i>			G5	S5	
Sweetheart Underwing	<i>Catocala amatrix</i>			G5	SNR	
Tabanus fulvicallus	<i>Tabanus fulvicallus</i>		SC	GNR	SNR	
Tadpole Physa	<i>Physella gyrina</i>			G5	S4	
Taiga Bluet	<i>Coenagrion resolutum</i>			G5	SU	
Tawny Emperor	<i>Asterocampa clyton</i>			G5	SU	
Tawny-edged Skipper	<i>Polites themistocles</i>			G5	S5	
Tetragonoderus fasciatus	<i>Tetragonoderus fasciatus</i>		SC	GNR	SNR	
Thaxter's Pinion Moth	<i>Lithophane thaxteri</i>			G4	SH	
Thicklip Rams-horn	<i>Planorbula armigera</i>			G5	S5	
Tidewater Mucket	<i>Leptodea ochracea</i>		T	G4	S2	X
Tiger Spiketail	<i>Cordulegaster erronea</i>		T	G4	S1	
Triangle Floater	<i>Alasmidonta undulata</i>			G4	SU	
Tule Bluet	<i>Enallagma carunculatum</i>			G5	S3	
Turquoise Bluet	<i>Enallagma divagans</i>			G5	S3	
Turret Snail	<i>Valvata tricarinata</i>		SC	G5	S1	
Turtle Head Borer Moth	<i>Papaipema nepheleptena</i>			G4	SNR	
Twelve-spotted Skimmer	<i>Libellula pulchella</i>			G5	S5	
Twin-horned Snaketail	<i>Ophiogomphus mainensis</i>			G4	S3	
Twin-spot Skipper	<i>Oligoria maculata</i>			G5	SNA	
Twin-spotted Spiketail	<i>Cordulegaster maculata</i>			G5	S5	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Two-ridge Rams-horn	<i>Helisoma anceps</i>			G5	S5	
Two-spotted Skipper	<i>Euphyes bimacula</i>		T	G4	S1	
Uhler's Sundragon	<i>Helocordulia uhleri</i>			G5	S3	
Ultronia Underwing	<i>Catocala ultronia</i>			G5	SNR	
Umbellifer Borer Moth	<i>Papaipema birdi</i>			G5	SNR	
Umber Shadowdragon	<i>Neurocordulia obsoleta</i>			G4	S2	
Unicorn Clubtail	<i>Arigomphus villosipes</i>			G5	S4	
Variable Dancer	<i>Argia fumipennis</i>			G5	S5	
Variable Darner	<i>Aeshna interrupta</i>			G5	SU	
Variiegated Fritillary	<i>Euptoieta claudia</i>			G5	SNA	
Variiegated Meadowhawk	<i>Sympetrum corruptum</i>			G5	SNA	
Vesper Bluet	<i>Enallagma vesperum</i>			G5	S3	
Viceroy	<i>Limenitis archippus</i>			G5	S5	
Violet Dart Moth	<i>Euxoa violaris</i>		T	G4	SNR	
Virginia River Snail	<i>Elimia virginica</i>		E	G4G5	S1	
Virile Crayfish	<i>Orconectes virilis</i>			G5	SNA	
Walker's Tusked Sprawler	<i>Anthopotamus verticis</i>		SC	G5	SNR	
Wandering Glider	<i>Pantala flavescens</i>			G5	S5N	
West Virginia White	<i>Pieris virginiensis</i>			G3G4	S4	
Whirlabout	<i>Polites vibex</i>			G5	SNA	
White Admiral or Red-spoted Purple	<i>Limenitis arthemis</i>			G5	S5	
White Underwing	<i>Catocala relict</i>			G5	SNR	
White-faced Meadowhawk	<i>Sympetrum obtrusum</i>			G5	S1	
White-m Hairstreak	<i>Parrhasius m-album</i>			G5	S3	
Whiteriver Crayfish	<i>Procambarus acutus</i>		SC	G5	SH	
Widow Skimmer	<i>Libellula luctuosa</i>			G5	S5	
Widow Underwing	<i>Catocala vidua</i>			G5	SNR	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	USESA	CTESA	Global Rank	State Rank	NE Rank
Wild Indigo Borer Moth	<i>Papaipema baptisiae</i>			G4	SNR	
Wild Indigo Duskywing	<i>Erynnis baptisiae</i>			G5	S4	
Williamson's Emerald	<i>Somatochlora williamsoni</i>			G5	S2	
Wonderful Underwing	<i>Catocala mira</i>			G5	SNR	
Woodentub Brine Shrimp	<i>Artemia gracilis</i>			GH	SH	
Woodland Pondsnaill	<i>Stagnicola catascopium</i>		SC	G5	S1	
Woody Underwing	<i>Catocala grynea</i>			G5	SNR	
Yellow Banded Underwing	<i>Catocala cerogama</i>			G5	SNR	
Yellow Bog Anarta	<i>Anarta luteola</i>		E	G4	S1	
Yellow Lampmussel	<i>Lampsilis cariosa</i>		SCX	G3G4	SH	X
Yellow-horned Beaded Lacewing	<i>Lomamyia flavicornis</i>		SC	GNR	SNR	
Yellow-legged Meadowhawk	<i>Sympetrum vicinum</i>			G5	S5	
Youthful Underwing	<i>Catocala subnata</i>			G5	SNR	
Zabulon Skipper	<i>Poanes zabulon</i>			G5	S4	
Zale curema	<i>Zale curema</i>		SC	G3G4	S1	
Zale obliqua	<i>Zale obliqua</i>		SC	G5	S2	
Zale submediana	<i>Zale submediana</i>		TX	G4	S1	
Zarucco Duskywing	<i>Erynnis zarucco</i>			G5	SNA	
Zebra Clubtail	<i>Stylurus scudderi</i>			G4	S2	
Zebra Swallowtail	<i>Eurytides marcellus</i>			G5	SNA	

Key to Global and State Ranks – excerpted from www.natureserve.org/explorer/ranking.htm#globalstatus

Global Conservation Status Definitions

Listed below are definitions for interpreting NatureServe global conservation status ranks (G-ranks). These ranks reflect an assessment of the condition of the species or ecological community across its entire range. Where indicated, definitions differ for species and ecological communities.

NatureServe Global Conservation Status Ranks

Basic Ranks

Rank	Definition
GX	Presumed Extinct (species)— Not located despite intensive searches and virtually no likelihood of rediscovery. Eliminated (ecological communities)—Eliminated throughout its range, with no restoration potential due to extinction of dominant or characteristic species.
GH	Possibly Extinct (species)— Missing; known from only historical occurrences but still some hope of rediscovery. Presumed Eliminated — (Historic, ecological communities)-Presumed eliminated throughout its range, with no or virtually no likelihood that it will be rediscovered, but with the potential for restoration, for example, American Chestnut Forest.
G1	Critically Imperiled —At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperiled —At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3	Vulnerable —At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4	Apparently Secure —Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure —Common; widespread and abundant.

Variant Ranks

Rank	Definition
G#G#	Range Rank —A numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).
GU	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. Whenever possible, the most likely rank is assigned and the question mark qualifier is added (e.g., G2?) to express uncertainty, or a range rank (e.g., G2G3) is used to delineate the limits (range) of uncertainty.
GNR	Unranked —Global rank not yet assessed.
GNA	Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers

Rank	Definition
?	Inexact Numeric Rank —Denotes inexact numeric rank (e.g., G2?)
Q	Questionable taxonomy —Taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation priority.
C	Captive or Cultivated Only —At present extant only in captivity or cultivation, or as a reintroduced population not yet established.

Intraspecific Taxon Conservation Status Ranks

Intraspecific taxa refer to subspecies, varieties and other designations below the level of the species. Intraspecific taxon status ranks (T-ranks) apply to plants and animal species only; these T-ranks do not apply to ecological communities.

Rank	Definition
T#	Intraspecific Taxon (trinomial)—The status of intraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T-rank cannot imply the subspecies or variety is more abundant than the species as a whole—for example, a G1T2 cannot occur. A vertebrate animal population, such as those listed as distinct population segments under the U.S. Endangered Species Act, may be considered an intraspecific taxon and assigned a T-rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status. At this time, the T rank is not used for ecological communities.

National and Subnational Conservation Status Definitions

Listed below are definitions for interpreting NatureServe conservation status ranks at the national (N-rank) and subnational (S-rank) levels. The term "subnational" refers to state or province-level jurisdictions (e.g., California, Ontario). Assigning national and subnational conservation status ranks for species and ecological communities follows the same general principles as used in assigning global status ranks. A subnational rank, however, cannot imply that the species or community is more secure at the state/province level than it is nationally or globally (i.e., a rank of G1S3 cannot occur), and similarly, a national rank cannot exceed the global rank. Subnational ranks are assigned and maintained by state or provincial natural heritage programs and conservation data centers.

National (N) and Subnational (S) Conservation Status Ranks

Status	Definition
NX SX	Presumed Extirpated —Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
NH SH	Possibly Extirpated (Historical) —Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
N1 S1	Critically Imperiled —Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
N2 S2	Imperiled —Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
N3 S3	Vulnerable —Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
N4 S4	Apparently Secure —Uncommon but not rare; some cause for long-term concern due to declines or other factors.
N5 S5	Secure —Common, widespread, and abundant in the nation or state/province.
NNR SNR	Unranked —Nation or state/province conservation status not yet assessed.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

NU SU	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
NNA SNA	Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
N#N# S#S#	Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
Not Provided	Species is known to occur in this nation or state/province. Contact the relevant natural heritage program for assigned conservation status.

Breeding Status Qualifiers

Qualifier	Definition
B	Breeding —Conservation status refers to the breeding population of the species in the nation or state/province.
N	Nonbreeding —Conservation status refers to the non-breeding population of the species in the nation or state/province.
M	Migrant —Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.

Other Qualifiers

Rank	Definition
?	Inexact or Uncertain —Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The following table features a modified system for assigning state conservation status ranks to fish species. These classifications vary slightly from those used by the standard “Heritage Ranking” system. The definitions of these modified rankings are as follows.

Fisheries Rank	Description
S1	Critically Imperiled
S2	Imperiled
S3	Rare/Uncommon
S3A	Depressed in abundance and declining or stable at low abundance
S3B	Depressed in abundance and increasing
S4	Apparently Secure
S5	Demonstrably Secure
SA	Accidental, recorded once or twice
SE	Exotic established
SH	Of Historical significance, not verified in 20 yrs
SR	Reported, without persuasive documentation
SRF	Reported in error
SU	Possibly in peril, status uncertain
SX	Apparently extirpated
S?	Not ranked

Common Name	<i>Scientific Name</i>	Fisheries Rank
Alewife	<i>Alosa pseudoharengus</i>	S2
American Eel	<i>Anguilla rostrata</i>	S3A
American Shad	<i>Alosa sapidissima</i>	S4
Atlantic Salmon	<i>Salmo salar</i>	S1
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>	S1
Blueback Herring	<i>Alosa aestivalis</i>	S2
Rainbow Smelt (anadromous)	<i>Osmerus mordax</i>	S1
Sea Lamprey	<i>Petromyzon marinus</i>	S4

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	Fisheries Rank
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	S1
American Brook Lamprey	<i>Lampetra appendix</i>	SU
Banded Sunfish	<i>Enneacanthus obesus</i>	SU
Black Crappie	<i>Pomoxis nigromaculatus</i>	S5
Blacknose Dace	<i>Rhinichthys atratulus</i>	S5
Bridle Shiner	<i>Notropis bifrenatus</i>	SU
Brook Trout (wild)	<i>Salvelinus fontinalis</i>	S3
Brown Trout (wild)	<i>Salmo trutta</i>	S3
Burbot	<i>Lota lota</i>	S1
Chain Pickerel	<i>Esox niger</i>	S4A
Common Shiner	<i>Luxilus cornutus</i>	S5
Creek Chubsucker	<i>Erimyzon oblongus</i>	S3
Cutlips Minnow	<i>Exoglossum maxillingua</i>	S3
Fallfish	<i>Semotilus corporalis</i>	S5
Fourspine Stickleback	<i>Apeltes quadracus</i>	S3
Golden Shiner	<i>Notemigonus crysoleucas</i>	S5
Largemouth Bass	<i>Micropterus salmoides</i>	S5
Longnose Dace	<i>Rhinichthys cataractae</i>	S5
Longnose Sucker	<i>Catostomus catostomus</i>	S3
Pumpkinseed	<i>Lepomis gibbosus</i>	S5
Redbreast Sunfish	<i>Lepomis auritus</i>	S5
Redfin Pickerel	<i>Esox americanus</i>	S4
Slimy Sculpin	<i>Cottus cognatus</i>	S3
Smallmouth Bass	<i>Micropterus dolomieu</i>	S5
Swamp Darter	<i>Etheostoma fusiforme</i>	SU
White Sucker	<i>Catostomus commersoni</i>	S5
Yellow Perch	<i>Perca flavescens</i>	S5
Atlantic Herring	<i>Clupea harengus</i>	S5
Atlantic Mackerel	<i>Scomber scombrus</i>	S4
Atlantic Silversides	<i>Menidia menidia</i>	S5

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	Fisheries Rank
Atlantic Tomcod	<i>Microgadus tomcod</i>	S2
Bay Anchovy	<i>Anchoa mitchilli</i>	S5
Butterfish	<i>Peprilus triacanthus</i>	S4
Clearnose Skate	<i>Raja eglanteria</i>	S4
Cunner	<i>Tautoglabrus adspersus</i>	S3A
Fourspot Flounder	<i>Paralichthys oblongus</i>	S3A
Hickory Shad	<i>Alosa mediocris</i>	S4
Hogchoker	<i>Trinectes maculatus</i>	S4
Lined Seahorse	<i>Hippocampus erectus</i>	SU
Little Skate	<i>Leucoraja erinacea</i>	S5
Longhorn Sculpin	<i>Myoxocephalus octodecemspinosus</i>	SU
Lumpfish	<i>Cyclopterus lumpus</i>	SU
Menhaden	<i>Brevoortia tyrannus</i>	S4
Mummichog	<i>Fundulus heteroclitus</i>	S4
Northern Puffer	<i>Sphoeroides maculatus</i>	S3A
Northern Seabobin	<i>Prionotus carolinus</i>	S4
Ocean Pout	<i>Macrozoarces americanus</i>	S3
Oyster Toadfish	<i>Opsanus tau</i>	SU
Pipefish	<i>Syngnathus fuscus</i>	S3A
Red Hake	<i>Urophycis chuss</i>	S3A
Roughtail Stingray	<i>Dasyatis centroura</i>	S3
Sand Lance	<i>Ammodytes americanus</i>	S4
Sandbar Shark	<i>Carcharhinus plumbeus</i>	S3
Sea Raven	<i>Hemitripterus americanus</i>	S3A
Sheepshead Minnow	<i>Cyprinodon variegatus</i>	S4
Silver Hake	<i>Merluccius bilinearis</i>	S3A
Smooth Dogfish	<i>Mustelis canis</i>	S4
Spiny Dogfish	<i>Squalus acanthias</i>	SU
Spotfin Killifish	<i>Fundulus luciae</i>	SU
Striped Bass	<i>Morone saxatilis</i>	S5

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Common Name	Scientific Name	Fisheries Rank
Striped Searobin	<i>Prionotus evolans</i>	S4
Tautog	<i>Tautoga onitis</i>	S3A
Weakfish	<i>Cynoscion regalis</i>	S3A
Windowpane Flounder	<i>Scophthalmus aquosus</i>	S3A
Winter Flounder	<i>Pseudopleuronectes americanus</i>	S3A
Winter Skate	<i>Leucoraja ocellata</i>	S4

Appendix 1c: Criteria Used to Identify Connecticut's GCN Species

This appendix lists the wildlife species determined to be in Greatest Conservation Need (GCN) in Connecticut. For each species, status information is listed according to the guidance categories provided by the IAFWA steering committee (2002). The information was derived from standardized ranks from the USFWS, CT DEP and NatureServe. The 15 categories in this appendix indicate reasons for conservation concern, including low and declining populations, endemism, etc. The information was reviewed and corroborated by Connecticut's Endangered Species Scientific Advisory Committee and other experts. This appendix addresses required Element number 1.

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Mammals															
Black Bear <i>Ursus americanus</i>	Common	X													
Bobcat <i>Felis rufus</i>	Common	X													
Deer Mouse <i>Peromyscus maniculatus</i>	Occasional	X				X									
Eastern Pipistrelle <i>Pipistrellus subflavus</i>	Uncommon	X													X
Eastern Small-footed Bat <i>Myotis leibii</i>	Extirpated	X									X				X
Hairy-Tailed Mole <i>Parascalops breweri</i>	Common	X							X						
Harbor Porpoise <i>Phocoena phocoena</i>	Common						X								
Harbor Seal <i>Phoca vitulina</i>	Common						X								
Hoary Bat <i>Lasiurus cinereus</i>	Uncommon	X													X
Indiana Bat <i>Myotis sodalis</i>	Occasional	X	X												
Least Shrew <i>Cryptotis parva</i>	Occasional	X				X	X				X				X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Little Brown Bat <i>Myotis lucifugus</i>	Common	X													X
Long-tailed Weasel <i>Mustela frenata</i>	Common	X													
Meadow Jumping Mouse <i>Zapus hudsonius</i>	Uncommon	X					X	X							
Mink <i>Mustela vison</i>	Common	X													
Muskrat <i>Ondatra zibethicus</i>	Common	X		X							X				X
New England Cottontail <i>Sylvilagus transitionalis</i>	Rare		X	X	X			X	X	X					
Northern Flying Squirrel <i>Glaucomys sabrinus</i>	Occasional	X									X				
Northern Long-eared Bat <i>Myotis septentrionalis</i>	Common	X													X
Northern Water Shrew <i>Sorex palustris</i>	Uncommon	X													
Red Bat <i>Lasiurus borealis</i>	Uncommon	X													X
Short-tailed Weasel <i>Mustela erminea</i>	Common	X													
Silver-haired Bat <i>Lasionycteris noctivagans</i>	Uncommon	X													X
Southern Bog Lemming <i>Synaptomys cooperi</i>	Uncommon	X						X							X
Southern Red-backed Vole <i>Clethrionomys gapperi</i>	Common	X						X							
Woodland Jumping Mouse <i>Napaeozapus insignis</i>	Uncommon	X					X	X							
Woodland Vole <i>Microtus pinetorum</i>	Uncommon	X													
Birds															
Acadian Flycatcher <i>Empidonax virescens</i>	Rare							X				X	X		
Alder Flycatcher <i>Empidonax alnorum</i>	Uncommon	X										X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
American Bittern <i>Botaurus lentiginosus</i>	Rare			X			X			X	X	X			
American Black Duck <i>Anas rubripes</i>	Common										X	X			X
American Kestrel <i>Falco sparverius</i>	Uncommon	X		X			X	X		X	X		X		
American Oystercatcher <i>Haematopus palliatus</i>	Uncommon						X	X						X	X
American Redstart <i>Setophaga ruticilla</i>	Common						X				X				
American Woodcock <i>Scolopax minor</i>	Common			X			X				X	X			
Bald Eagle <i>Haliaeetus leucocephalus</i>	Uncommon						X								X
Baltimore Oriole <i>Icterus galbula</i>	Common	X		X											
Bank Swallow <i>Riparia riparia</i>	Uncommon						X								X
Barn Owl <i>Tyto alba</i>	Rare	X		X			X	X	X		X	X			
Barred Owl <i>Strix varia</i>	Common													X	
Bay-breasted Warbler <i>Dendroica castanea</i>	Rare	X									X				
Belted Kingfisher <i>Ceryle alcyon</i>	Common			X			X								
Black Rail <i>Laterallus jamaicensis</i>	Occasional	X					X	X			X	X			X
Black Scoter <i>Melanitta nigra</i>	Uncommon			X											X
Black Skimmer <i>Rynchops niger</i>	Rare						X	X			X				X
Black-and-white Warbler <i>Mniotilta varia</i>	Common	X		X							X				
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i>	Uncommon	X		X			X				X		X		
Blackburnian Warbler <i>Dendroica fusca</i>	Uncommon	X		X			X	X			X		X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Black-crowned Night-heron <i>Nycticorax nycticorax</i>	Locally															X
Black-throated Blue Warbler <i>Dendroica caerulescens</i>	Uncommon	X					X				X		X			
Black-throated Green Warbler <i>Dendroica virens</i>	Common						X				X					
Blue-gray Gnatcatcher <i>Poliophtila caerulea</i>	Uncommon						X									
Blue-headed Vireo <i>Vireo solitarius</i>	Uncommon										X		X			
Blue-winged Teal <i>Anas discors</i>	Uncommon										X					X
Blue-winged Warbler <i>Vermivora pinus</i>	Common			X						X	X	X	X	X		
Bobolink <i>Dolichonyx oryzivorus</i>	Locally	X		X			X	X		X	X					X
Broad-winged Hawk <i>Buteo platypterus</i>	Uncommon			X												X
Brown Creeper <i>Certhia americana</i>	Uncommon	X		X						X						
Brown Thrasher <i>Toxostoma rufum</i>	Uncommon	X		X			X				X	X	X			X
Canada Warbler <i>Wilsonia canadensis</i>	Uncommon			X			X			X	X					
Canvasback <i>Aythya valisineria</i>	Uncommon			X												X
Cape May Warbler <i>Dendroica tigrina</i>	Rare										X					
Cerulean Warbler <i>Dendroica cerulea</i>	Uncommon	X					X			X	X				X	
Chestnut-sided Warbler <i>Dendroica pensylvanica</i>	Uncommon	X		X			X				X				X	
Chimney Swift <i>Chaetura pelagica</i>	Common	X		X			X				X				X	
Clapper Rail <i>Rallus longirostris</i>	Locally						X				X	X	X			X
Cliff Swallow <i>Petrochelidon pyrrhonota</i>	Rare						X									X
Common Loon <i>Gavia immer</i>	Uncommon										X	X				X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Common Merganser <i>Mergus merganser</i>	Common														X
Common Moorhen <i>Gallinula chloropus</i>	Occasional						X				X	X			
Common Nighthawk <i>Chordeiles minor</i>	Unknown			X			X	X			X	X	X	X	
Common Raven <i>Corvus corax</i>	Uncommon						X								
Common Tern <i>Sterna hirundo</i>	Locally			X			X					X			X
Cooper's Hawk <i>Accipiter cooperii</i>	Uncommon	X					X								
Dark-eyed Junco <i>Junco hyemalis</i>	Rare			X							X				
Eastern Kingbird <i>Tyrannus tyrannus</i>	Common			X									X		X
Eastern Meadowlark <i>Sturnella magna</i>	Uncommon	X		X			X	X		X	X		X		
Eastern Screech-owl <i>Otus asio</i>	Uncommon			X							X				
Eastern Towhee <i>Pipilo erythrophthalmus</i>	Uncommon	X		X			X				X		X		
Eastern Wood-pewee <i>Contopus virens</i>	Common	X		X								X	X		
Field Sparrow <i>Spizella pusilla</i>	Uncommon	X		X			X				X				
Glossy Ibis <i>Plegadis falcinellus</i>	Uncommon						X				X	X			X
Golden-crowned Kinglet <i>Regulus satrapa</i>	Uncommon	X					X				X	X	X		
Golden-winged Warbler <i>Vermivora chrysoptera</i>	Rare	X		X			X	X			X				
Grasshopper Sparrow <i>Ammodramus savannarum</i>	Rare			X			X	X							
Gray Catbird <i>Dumetella carolinensis</i>	Abundant													X	
Gray-cheeked Thrush <i>Catharus minimus</i>	Occasional										X				
Great Blue Heron <i>Ardea herodias</i>	Common										X	X			X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Great Cormorant <i>Phalacrocorax carbo</i>	Common												X		X
Great Crested Flycatcher <i>Myiarchus crinitus</i>	Common	X		X									X		
Great Egret <i>Ardea alba</i>	Locally						X	X			X	X			X
Great Horned Owl <i>Bubo virginianus</i>	Common	X									X				
Greater Scaup <i>Aythya marila</i>	Common	X		X							X	X			X
Green Heron <i>Butorides virescens</i>	Common	X		X			X				X	X	X		
Hermit Thrush <i>Catharus guttatus</i>	Uncommon											X	X		
Hooded Merganser <i>Lophodytes cucullatus</i>	Common										X	X			X
Hooded Warbler <i>Wilsonia citrina</i>	Uncommon	X													
Horned Grebe <i>Podiceps auritus</i>	Uncommon														X
Horned Lark <i>Eremophila alpestris</i>	Rare	X		X			X	X					X		X
Indigo Bunting <i>Passerina cyanea</i>	Uncommon	X		X								X			
Ipswich Sparrow <i>Passerculus sandwichensis princeps</i>	Rare							X			X				X
King Rail <i>Rallus elegans</i>	Occasional						X	X			X	X	X		
Least Bittern <i>Ixobrychus exilis</i>	Rare	X		X			X	X			X	X			
Least Flycatcher <i>Empidonax minimus</i>	Uncommon	X		X											
Least Tern <i>Sterna antillarum</i>	Locally			X			X	X			X	X			X
Lesser Scaup <i>Aythya affinis</i>	Uncommon			X											X
Little Blue Heron <i>Egretta caerulea</i>	Uncommon						X	X			X	X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Long-eared Owl <i>Asio otus</i>	Rare						X				X				X
Long-tailed Duck <i>Clangula hyemalis</i>	Locally			X							X				X
Louisiana Waterthrush <i>Seiurus motacilla</i>	Common						X				X				
Magnolia Warbler <i>Dendroica magnolia</i>	Rare	X													
Marsh Wren <i>Cistothorus palustris</i>	Locally			X			X					X			
Northern Bobwhite <i>Colinus virginianus</i>	Rare	X		X			X	X		X	X				
Northern Flicker <i>Colaptes auratus</i>	Common													X	
Northern Goshawk <i>Accipiter gentilis</i>	Rare	X					X					X	X		
Northern Harrier <i>Circus cyaneus</i>	Uncommon										X				
Northern Parula <i>Parula americana</i>	Rare			X											
Northern Rough-winged Swallow <i>Stelgidopteryx serripennis</i>	Common						X								X
Northern Saw-whet Owl <i>Aegolius acadicus</i>	Rare										X				X
Northern Waterthrush <i>Seiurus noveboracensis</i>	Uncommon						X				X				
Olive-sided Flycatcher <i>Contopus borealis</i>	Rare	X													
Orchard Oriole <i>Icterus spurius</i>	Uncommon	X		X				X							
Osprey <i>Pandion haliaetus</i>	Common														
Ovenbird <i>Seiurus aurocapillus</i>	Common										X				
Peregrine Falcon <i>Falco peregrinus</i>	Rare							X			X				
Pied-billed Grebe <i>Podilymbus podiceps</i>	Rare						X	X			X	X			X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Pileated Woodpecker <i>Dryocopus pileatus</i>	Uncommon						X						X		
Piping Plover <i>Charadrius melodus</i>	Rare			X			X	X			X	X			X
Prairie Warbler <i>Dendroica discolor</i>	Common	X		X				X		X	X		X	X	
Purple Finch <i>Carpodacus purpureus</i>	Uncommon	X		X											
Purple Martin <i>Progne subis</i>	Locally						X	X		X			X		X
Red-breasted Nuthatch <i>Sitta canadensis</i>	Uncommon											X	X		
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	Rare			X						X	X				
Red-necked Grebe <i>Podiceps grisegena</i>	Rare														X
Red-shouldered Hawk <i>Buteo lineatus</i>	Uncommon											X			
Red-throated Loon <i>Gavia stellata</i>	Uncommon						X								X
Roseate Tern <i>Sterna dougallii</i>	Uncommon			X			X	X			X	X			X
Rose-breasted Grosbeak <i>Pheucticus ludovicianus</i>	Common	X		X							X				
Rough-legged Hawk <i>Buteo lagopus</i>	Uncommon	X						X							
Ruby-throated Hummingbird <i>Archilochus colubris</i>	Common	X													
Ruddy Turnstone <i>Arenaria interpres</i>	Locally														X
Ruffed Grouse <i>Bonasa umbellus</i>	Rare	X		X			X				X	X			
Saltmarsh Sharp-tailed Sparrow <i>Ammodramus caudacutus</i>	Locally	X	X				X			X	X	X	X	X	X
Sanderling <i>Calidris alba</i>	Common			X											X
Savannah Sparrow <i>Passerculus sandwichensis</i>	Locally	X		X			X			X	X				

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Scarlet Tanager <i>Piranga olivacea</i>	Common			X							X				
Seaside Sparrow <i>Ammodramus maritimus</i>	Uncommon	X						X			X	X	X	X	
Sedge Wren <i>Cistothorus platensis</i>	Rare						X					X			
Semipalmated Sandpiper <i>Calidris pusilla</i>	Common			X											X
Sharp-shinned Hawk <i>Accipiter striatus</i>	Uncommon	X		X			X	X							
Short-eared Owl <i>Asio flammeus</i>	Rare			X			X				X				X
Snowy Egret <i>Egretta thula</i>	Locally						X	X			X	X	X		X
Snowy Owl <i>Nyctea scandiaca</i>	Rare										X				X
Sora <i>Porzana carolina</i>	Uncommon						X					X			
Spotted Sandpiper <i>Actitis macularia</i>	Common						X				X	X			
Surf Scoter <i>Melanitta perspicillata</i>	Uncommon			X											X
Swainson's Thrush <i>Catharus ustulatus</i>	Uncommon										X				
Upland Sandpiper <i>Bartramia longicauda</i>	Rare						X	X		X					
Veery <i>Catharus fuscescens</i>	Common			X							X				
Vesper Sparrow <i>Pooecetes gramineus</i>	Rare			X				X		X	X				
Virginia Rail <i>Rallus limicola</i>	Uncommon						X					X	X		
Warbling Vireo <i>Vireo gilvus</i>	Common											X	X		
Whip-poor-will <i>Caprimulgus vociferus</i>	Uncommon	X		X			X			X	X				
White-eyed Vireo <i>Vireo griseus</i>	Uncommon										X				
White-winged Scoter <i>Melanitta fusca</i>	Uncommon			X											X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Willet <i>Catoptrophorus semipalmatus</i>	Uncommon										X					
Willow Flycatcher <i>Empidonax traillii</i>	Locally											X	X			
Winter Wren <i>Troglodytes troglodytes</i>	Uncommon									X						
Wood Thrush <i>Hylocichla mustelina</i>	Common			X			X				X	X	X	X		
Worm-eating Warbler <i>Helmitheros vermivorus</i>	Locally									X	X					
Yellow-billed Cuckoo <i>Coccyzus americanus</i>	Uncommon	X		X			X				X		X			
Yellow-breasted Chat <i>Icteria virens</i>	Rare	X		X			X	X			X					
Yellow-crowned Night-heron <i>Nyctanassa violacea</i>	Uncommon						X				X	X			X	
Yellow-rumped Warbler <i>Dendroica coronata</i>	Rare						X						X			
Yellow-throated Vireo <i>Vireo flavifrons</i>	Uncommon										X	X	X			
Reptiles & Amphibians																
Blue-spotted Salamander <i>Ambystoma laterale</i>	Uncommon			X												X
Blue-spotted Salamander <i>Ambystoma laterale</i>	Occasional			X				X								
Bog Turtle <i>Glyptemys muhlenbergii</i>	Occasional	X	X	X			X	X	X	X						
Common Five-lined Skink <i>Eumeces fasciatus</i>	Rare			X												
Copperhead <i>Agkistrodon contortrix</i>	Uncommon	X														X
Diamond-backed Terrapin <i>Malaclemys terrapin</i>	Common	X		X			X				X	X	X			X
Eastern Box Turtle <i>Terrapene carolina</i>	Uncommon			X					X			X				
Eastern Hog-nosed Snake <i>Heterodon platirhinos</i>	Uncommon	X		X					X			X				
Eastern Newt <i>Notophthalmus viridescens</i>	Common			X												X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Eastern Racer <i>Coluber constrictor</i>	Common	X													
Eastern Ribbonsnake <i>Thamnophis sauritus</i>	Uncommon	X		X								X			
Eastern Spadefoot <i>Scaphiopus holbrookii</i>	Occasional	X	X	X				X							
Fowler's Toad <i>Bufo fowleri</i>	Uncommon	X													
Gray Treefrog <i>Hyla versicolor</i>	Common	X													
Green Seaurtle <i>Chelonia mydas</i>	Occasional			X											
Jefferson Salamander <i>Ambystoma jeffersonianum</i>	Uncommon	X		X								X			X
Kemp's Ridley Seaurtle <i>Lepidochelys kempii</i>	Occasional			X											
Leatherback Seaurtle <i>Dermochelys coriacea</i>	Occasional			X											
Loggerhead Seaurtle <i>Caretta caretta</i>	Occasional				X										
Marbled Salamander <i>Ambystoma opacum</i>	Uncommon			X								X			X
Northern Dusky Salamander <i>Desmognathus fuscus</i>	Common			X											
Northern Leopard Frog <i>Rana pipiens</i>	Rare	X		X											
Northern Slimy Salamander <i>Plethodon glutinosus</i>	Rare			X											
Northern Spring Salamander <i>Gyrinophilus porphyriticus</i>	Rare											X			
Smooth Greensnake <i>Ophedrys vernalis</i>	Uncommon	X		X											
Spotted Salamander <i>Ambystoma maculatum</i>	Common			X								X			X
Spotted Turtle <i>Clemmys guttata</i>	Uncommon			X								X			
Timber Rattlesnake <i>Crotalus horridus</i>	Occasional			X			X					X			X
Wood Frog <i>Rana sylvatica</i>	Common			X											X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Wood Turtle <i>Glyptemys insculpta</i>	Uncommon			X								X			
Fish															
Alewife <i>Alosa pseudoharengus</i>	Common	X		X			X				X	X			X
American Brook Lamprey <i>Lampetra appendix</i>	Rare	X		X		X	X	X	X	X			X		X
American Eel <i>Anguilla rostrata</i>	Common	X		X			X				X	X		X	
American Shad <i>Alosa sapidissima</i>	Common	X		X			X	X			X	X			
Atlantic Herring <i>Clupea harengus</i>	Abundant			X										X	X
Atlantic Mackerel <i>Scomber scombrus</i>	Rare			X							X			X	X
Atlantic Salmon <i>Salmo salar</i>	Rare	X									X	X			
Atlantic Silversides <i>Menidia menidia</i>	Abundant												X		X
Atlantic Sturgeon <i>Acipenser oxyrinchus</i>	Occasional			X			X	X			X				X
Atlantic Tomcod <i>Microgadus tomcod</i>	Rare	X	X	X			X	X			X	X			X
Banded Sunfish <i>Enneacanthus obesus</i>	Uncommon	X		X		X	X	X	X	X	X	X			X
Bay Anchovy <i>Anchoa mitchilli</i>	Abundant														X
Black Crappie <i>Pomoxis nigromaculatus</i>	Common	X													
Blacknose Dace <i>Rhinichthys atratulus</i>	Abundant	X											X		
Blueback Herring <i>Alosa aestivalis</i>	Uncommon	X		X				X			X	X			X
Bridle Shiner <i>Notropis bifrenatus</i>	Uncommon	X		X			X	X		X	X				

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Brook Trout (wild) <i>Salvelinus fontinalis</i>	Common	X					X	X		X	X	X	X		
Brown Trout (wild) <i>Salmo trutta</i>	Common	X					X			X					
Burbot <i>Lota lota</i>	Occasional	X					X	X	X	X	X				X
Butterfish <i>Peprilus triacanthus</i>	Abundant														X
Chain Pickerel <i>Esox niger</i>	Common	X		X			X				X		X		
Clearnose Skate <i>Raja eglanteria</i>	Uncommon	X					X				X			X	X
Common Shiner <i>Luxilus cornutus</i>	Common	X													
Creek Chubsucker <i>Erimyzon oblongus</i>	Uncommon								X	X			X		
Cunner <i>Tautoglabrus adspersus</i>	Common	X		X			X		X		X	X	X	X	X
Cutlips Minnow <i>Exoglossum maxillingua</i>	Common	X							X						
Fallfish <i>Semotilus corporalis</i>	Common	X													
Fourspine Stickleback <i>Apeltes quadracus</i>	Uncommon	X				X		X	X	X					
Fourspot Flounder <i>Paralichthys oblongus</i>	Common														X
Golden Shiner <i>Notemigonus crysoleucas</i>	Common	X											X		
Hickory Shad <i>Alosa mediocris</i>	Locally	X							X						X
Hogchoker <i>Trinectes maculatus</i>	Common														X
Largemouth Bass <i>Micropterus salmoides</i>	Abundant	X													
Lined Seahorse <i>Hippocampus erectus</i>	Uncommon	X										X			
Little Skate <i>Leucoraja erinacea</i>	Abundant										X			X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Longhorn Sculpin <i>Myoxocephalus</i>	Uncommon	X		X									X		X
Longnose Dace <i>Rhinichthys cataractae</i>	Common	X											X		
Longnose Sucker <i>Catostomus catostomus</i>	Occasional	X						X							
Lumpfish <i>Cyclopterus lumpus</i>	Uncommon						X	X							
Menhaden <i>Brevoortia tyrannus</i>	Common	X									X			X	X
Mummichog <i>Fundulus heteroclitus</i>	Abundant								X				X		X
Northern Puffer <i>Sphoeroides maculatus</i>	Rare	X								X	X		X		X
Northern Searobin <i>Prionotus carolinus</i>	Common	X									X				X
Ocean Pout <i>Macrozoarces americanus</i>	Locally					X	X	X	X	X	X				X
Oyster Toadfish <i>Opsanus tau</i>	Uncommon														X
Pipefish <i>Syngnathus fuscus</i>	Common														
Pumpkinseed <i>Lepomis gibbosus</i>	Abundant	X													
Rainbow Smelt (anadromous) <i>Osmerus mordax</i>	Rare	X	X	X		X	X				X	X			
Red Hake <i>Urophycis chuss</i>	Common	X		X			X				X			X	X
Redbreast Sunfish <i>Lepomis auritus</i>	Common	X											X		
Redfin Pickerel <i>Esox americanus</i>	Common	X				X			X	X					
Roughtail Stingray <i>Dasyatis centroura</i>	Rare						X	X	X		X				X
Sand Lance <i>Ammodytes americanus</i>	Uncommon	X		X			X		X		X	X			X
Sandbar Shark <i>Carcharhinus plumbeus</i>	Occasional														

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Sea Lamprey <i>Petromyzon marinus</i>	Common	X					X	X	X		X				
Sea Raven <i>Hemipterus americanus</i>	Uncommon	X		X		X	X		X	X	X		X		X
Sheepshead Minnow <i>Cyprinodon variegatus</i>	Locally					X	X	X	X	X			X		X
Shortnose Sturgeon <i>Acipenser brevirostrum</i>	Uncommon	X					X	X	X		X	X			X
Silver Hake <i>Merluccius bilinearis</i>	Uncommon	X		X			X				X			X	X
Slimy Sculpin <i>Cottus cognatus</i>	Uncommon	X		X		X	X		X	X	X		X		
Smallmouth Bass <i>Micropterus dolomieu</i>	Common	X													
Smooth Dogfish <i>Mustelis canis</i>	Common	X					X				X			X	X
Spiny Dogfish <i>Squalus acanthias</i>	Uncommon	X	X	X			X		X		X	X		X	X
Spotfin Killifish <i>Fundulus luciae</i>	Rare														X
Striped Bass <i>Morone saxatilis</i>	Abundant	X									X	X		X	X
Striped Searobin <i>Prionotus evolans</i>	Common														X
Swamp Darter <i>Etheostoma fusiforme</i>	Uncommon	X							X	X	X				
Tautog <i>Tautoga onitis</i>	Common	X		X			X		X		X	X	X	X	X
Weakfish <i>Cynoscion regalis</i>	Abundant	X		X							X			X	X
White Sucker <i>Catostomus commersoni</i>	Abundant	X													
Windowpane Flounder <i>Scophthalmus aquosus</i>	Uncommon	X		X			X				X	X			X
Winter Flounder <i>Pseudopleuronectes americanus</i>	Common	X	X	X			X				X	X	X	X	X
Winter Skate <i>Leucoraja ocellata</i>	Common			X			X	X			X			X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Yellow Perch <i>Perca flavescens</i>	Abundant	X														
<i>Invertebrates</i>																
Acronicta lanceolaria <i>Acronicta lanceolaria</i>	Extirpated		X				X	X		X	X	X	X			
Agonum darlingtoni <i>Agonum darlingtoni</i>	Uncommon									X	X					
Agonum mutatum <i>Agonum mutatum</i>	Uncommon									X	X					
Amara chalcea <i>Amara chalcea</i>	Uncommon									X	X		X			
American Burying Beetle <i>Nicrophorus americanus</i>	Extirpated															
American Lobster <i>Homarus americanus</i>	Abundant	X	X	X			X				X	X	X	X	X	
American Rubyspot <i>Hetaerina americana</i>	Rare	X		X				X		X	X					
Annoited Sallow Moth <i>Pyreferra ceromatica</i>	Extirpated															
Apamea burgessi <i>Apamea burgessi</i>	Uncommon									X			X			
Appalachian Blue <i>Celastrina neglectamajor</i>	Rare		X				X	X	X	X	X	X	X			
Atlantic Bluet <i>Enallagma doubledayi</i>	Rare						X	X		X	X					
Atlantis Fritillary <i>Speyeria atlantis</i>	Rare		X				X	X			X	X	X			
Atylotus ohioensis <i>Atylotus ohioensis</i>	Rare						X		X		X		X			
Aureolaria Seed Borer <i>Rhodoecia aurantiago</i>	Unknown															
Badister transversus <i>Badister transversus</i>	Uncommon									X	X					
Baetisca lacustris <i>Baetisca lacustris</i>	Occasional						X			X	X					

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Baetisca obesa <i>Baetisca obesa</i>	Occasional						X			X	X				
Banded Bog Skimmer <i>Williamsonia lintneri</i>	Rare		X				X	X		X					
Barrens Dagger Moth <i>Acrionicta albarufa</i>	Extirpated		X				X	X		X	X	X	X		
Barrens Itame <i>Itame sp.</i>	Rare	X	X			X	X	X	X	X		X	X		
Barrens Metarranthis Moth <i>Metarranthis apiciaria</i>	Extirpated														
Bay Scallop <i>Argopecten irradians</i>	Rare	X	X	X		X	X	X	X	X	X	X	X	X	X
Bembidion carinula <i>Bembidion carinula</i>	Occasional						X				X				
Bembidion lacunarium <i>Bembidion lacunarium</i>	Uncommon						X				X				
Bembidion planum <i>Bembidion planum</i>	Uncommon						X				X				
Bembidion pseudocautum <i>Bembidion pseudocautum</i>	Occasional									X	X				
Bembidion quadratum <i>Bembidion quadratum</i>	Uncommon									X	X				
Bembidion semicinctum <i>Bembidion semicinctum</i>	Uncommon						X				X				
Bembidion simplex <i>Bembidion simplex</i>	Uncommon						X				X				
Bembidion tetracolum <i>Bembidion tetracolum</i>	Uncommon										X				
Black Lordithon Rove Beetle <i>Lordithon niger</i>	Extirpated														
Blue Corporal Dragonfly <i>Ladona deplanata</i>	Rare									X	X				
Blue Crab <i>Callinectes sapidus</i>	Uncommon	X												X	
Blue Mussel <i>Mytilus edulis</i>	Occasional														X
Bog Copper <i>Lycaena epixanthe</i>	Uncommon							X	X	X	X	X	X		
Bog Tiger Moth <i>Grammia speciosa</i>	Rare														

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Boreal Fossaria <i>Fossaria galbana</i>	Extirpated															
Boreal Turret Snail <i>Valvata sincera</i>	Rare			X												
Brachinus cyanipennis <i>Brachinus cyanipennis</i>	Extirpated						X				X					
Brachinus fumans <i>Brachinus fumans</i>	Occasional						X				X					
Brachinus medius <i>Brachinus medius</i>	Occasional						X				X					
Brachinus ovipennis <i>Brachinus ovipennis</i>	Occasional						X				X					
Brachinus patruelis <i>Brachinus patruelis</i>	Occasional							X	X		X					
Bronze Copper <i>Lycaena hylus</i>	Rare						X	X	X	X	X	X	X			
Brook Floater <i>Alasmodonta varicosa</i>	Rare		X			X										
Buck Moth <i>Hemileuca maia</i>	Extirpated															
Calosoma wilcoxi <i>Calosoma wilcoxi</i>	Extirpated			X							X					
Carabus serratus <i>Carabus serratus</i>	Extirpated			X							X					
Carabus sylvosus <i>Carabus sylvosus</i>	Extirpated			X					X		X					
Carabus vinctus <i>Carabus vinctus</i>	Extirpated						X				X					
Chaetagnela cerata <i>Chaetagnela cerata</i>	Extirpated		X	X			X	X			X	X				
Channeled Whelk <i>Busycotypus canaliculatum</i>	Uncommon	X														X
Cicada <i>Tibicen auletes</i>	Extirpated			X					X		X					
Cicindela marginata <i>Cicindela marginata</i>	Rare															
Cicindela purpurea <i>Cicindela purpurea</i>	Extirpated															

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Cinygmula subaequalis <i>Cinygmula subaequalis</i>	Rare	X									X				
Clam Shrimp <i>Eulimnadia agassizii</i>	Extirpated														
Coastal Heathland Cutworm <i>Abagrotis nefascia benjamini</i>	Rare		X				X	X		X	X	X	X		
Coastal Mud Shrimp <i>Upogebia affinis</i>	Occasional														
Coastal Pond Amphipod <i>Synurella chamberlaini</i>	Unknown														
Cobra Clubtail <i>Gomphus vastus</i>	Rare						X			X	X				
Columbine Borer <i>Papaipema leucostigma</i>	Rare														
Columbine Duskywing <i>Erynnis lucilius</i>	Rare		X	X			X	X		X	X	X	X		
Common Oyster <i>Crassostrea virginica</i>	Occasional	X										X			
Common Razor Clam <i>Ensis directus</i>	Occasional														
Common Roadside Skipper <i>Amblyscirtes vialis</i>	Rare		X	X			X	X		X	X				
Common Sanddragon <i>Progomphus obscurus</i>	Rare	X									X				
Crimson-ringed Whiteface <i>Leucorrhinia glacialis</i>	Rare						X	X		X					
Cucullia speyeri <i>Cucullia speyeri</i>	Extirpated														
Culvers Root Borer <i>Papaipema sciata</i>	Extirpated														
Dark-bellied Tiger Beetle <i>Cicindela tranquebarica</i>	Rare														
Disc Gyro <i>Gyraulus circumstriatus</i>	Common														
Dune Ghost Tiger Beetle <i>Cicindela lepida</i>	Rare														
Dwarf Wedge Mussel <i>Alasmidonta heterodon</i>	Occasional		X			X									

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Eastern Pearlshell <i>Margaritifera margaritifera</i>	Uncommon			X											
Eastern Pond Mussel <i>Ligumia nasuta</i>	Uncommon														
Eucoptocnemis fimbriaris <i>Eucoptocnemis fimbriaris</i>	Uncommon														
Euxoa pleuritica <i>Euxoa pleuritica</i>	Rare														
Eyed Brown <i>Satyrodes eurydice</i>	Uncommon										X	X	X		
Fiddler Crabs <i>Uca spp.</i>	Locally														
Flat Claw Hermit Crab <i>Pagurus pollicaris</i>	Rare														
Frosted Elfin <i>Callophrys irus</i>	Uncommon		X	X			X	X		X	X	X	X		
Geopinus incrassatus <i>Geopinus incrassatus</i>	Uncommon						X				X				
Ghost Shrimp <i>Gilvossius setimanus</i>	Occasional														
Goniops chrysocoma <i>Goniops chrysocoma</i>	Rare						X	X		X	X				
Grass Shrimp <i>Hippolyte spp.</i>	Occasional														X
Grassland Thaumtopsias <i>Thaumtopsias edonis</i>	Rare	X	X			X	X	X		X		X	X		
Gray Comma <i>Polygonia progne</i>	Extirpated														
Green Crab <i>Carcinus maenas</i>	Uncommon		X				X				X				
Hairy-necked Tiger Beetle <i>Cicindela hirticollis</i>	Rare														
Harpalus caliginosus <i>Harpalus caliginosus</i>	Occasional									X	X				
Harpalus eraticus <i>Harpalus eraticus</i>	Uncommon							X			X				
Harpoon Clubtail <i>Gomphus descriptus</i>	Rare						X	X		X					
Harris's Checkerspot <i>Chlosyne harrisii</i>	Rare		X	X			X	X		X	X	X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Helluomorphoides praeustus <i>Helluomorphoides praeustus</i>	Occasional									X	X				
Henry's Elfin <i>Callophrys henrici</i>	Uncommon														
Herodias Underwing <i>Catocala herodias gerhardi</i>	Rare		X				X	X		X	X	X	X		
Hessel's Hairstreak <i>Mitoura hesseli</i>	Rare							X		X	X	X	X		
Hoary Elfin <i>Callophrys polios</i>	Extirpated						X	X	X		X	X	X		
Hop Vine Borer Moth <i>Hydraecia immanis</i>	Extirpated														
Hops-stalk Borer <i>Papaipema circumlucens</i>	Extirpated														
Horace's Duskywing <i>Erynnis horatius</i>	Rare		X	X			X				X	X	X		
Horseshoe Crab <i>Limulus polyphemus</i>	Common	X		X			X				X	X	X	X	X
Hybomitra frosti <i>Hybomitra frosti</i>	Rare						X	X		X			X		
Hybomitra longiglossa <i>Hybomitra longiglossa</i>	Occasional						X	X		X			X		
Hybomitra lurida <i>Hybomitra lurida</i>	Rare						X				X				
Hybomitra trepida <i>Hybomitra trepida</i>	Rare														
Hybomitra typhus <i>Hybomitra typhus</i>	Rare						X	X			X				
Imperial Moth <i>Eacles imperialis</i>	Extirpated														
Jonah Crab <i>Cancer borealis</i>	Occasional														
Knobbed Whelk <i>Busycon carica</i>	Uncommon	X												X	
Labrador Tea Tentiform <i>Phyllonorycter ledella</i>	Rare														
Lady Crab <i>Ovalipes ocellatus</i>	Occasional														

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Lemmer's Noctuid Moth <i>Lithophane lemmeri</i>	Extirpated															
Leptophlebia bradleyi <i>Leptophlebia bradleyi</i>	Uncommon					X					X					
Little Bluet <i>Enallagma minusculum</i>	Rare						X	X		X	X					
Long-finned Squid <i>Loligo pealeii</i>	Abundant	X					X				X	X		X		X
Loxandrus vitiosus <i>Loxandrus vitiosus</i>	Unknown							X			X					
Lymnaeid Snail <i>Fossaria rustica</i>	Rare															
Mantis Shrimp <i>Squilla empusa</i>	Common															
Maritime Sunflower Borer <i>Papaipema maritima</i>	Extirpated															
Merycomyia whitneyi <i>Merycomyia whitneyi</i>	Rare						X	X			X					
Midland Clubtail <i>Gomphus fraternus</i>	Rare						X	X		X						
Mixogaster johnsoni <i>Mixogaster johnsoni</i>	Extirpated										X					
Mottled Duskywing <i>Erynnis martialis</i>	Extirpated		X							X	X	X	X			
Mud Crabs <i>Family Xanthidae</i>	Common															
Mustached Clubtail <i>Gomphus adelphus</i>	Rare						X	X		X						
Mystic Valley Amphipod <i>Crangonyx aberrans</i>	Unknown															
Nebria lacustris lacustris <i>Nebria lacustris lacustris</i>	Occasional									X	X					
New Jersey Tea Inchworm <i>Apodrepanulatrix liberaria</i>	Rare		X	X			X	X	X	X	X	X	X			
Newman's Brocade <i>Meropleon ambifusca</i>	Rare															
Northeastern Beach Tiger Beetle <i>Cicindela dorsalis dorsalis</i>	Extirpated															
Northern Metalmark <i>Calephelis borealis</i>	Rare		X	X			X	X	X	X	X	X	X			

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Omophron tessellatum <i>Omophron tessellatum</i>	Extirpated			X							X				
Pale Green Pinion Moth <i>Lithophane viridipallens</i>	Extirpated														
Panagaeus fasciatus <i>Panagaeus fasciatus</i>	Extirpated			X							X				
Paraleptophlebia assimilis <i>Paraleptophlebia assimilis</i>	Occasional					X					X				
Persius Duskywing <i>Erynnis persius persius</i>	Rare		X	X			X	X		X	X	X	X		
Phyllira Tiger Moth <i>Grammia phyllira</i>	Rare														
Piedmont Groundwater <i>Stygobromus tenuis</i>	Rare														
Pine Barrens Tiger Beetle <i>Cicindela formosa generosa</i>	Uncommon														
Pine Barrens Zanclognatha <i>Zanclognatha martha</i>	Rare														
Pink Sallow <i>Psectraglaea carnosae</i>	Common														
Pink Streak <i>Faronta rubripennis</i>	Rare														
Pitcher Plant Borer Moth <i>Papaipema appassionata</i>	Rare														
Pitcher Plant Moth <i>Exyra rolandiana</i>	Rare														
Precious Underwing <i>Catocala pretiosa</i>	Extirpated														
Puritan Tiger Beetle <i>Cicindela puritana</i>	Rare														
Purse-web Spider <i>Sphodros niger</i>	Uncommon														
Rapids Clubtail <i>Gomphus quadricolor</i>	Rare						X	X		X					
Regal Fritillary <i>Speyeria idalia</i>	Extirpated			X											
Regal Moth <i>Citheronia regalis</i>	Extirpated														

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Riverine Clubtail <i>Stylurus amnicola</i>	Rare						X	X		X					
Rock Crab <i>Cancer irroratus</i>	Uncommon														
Sand Shrimp <i>Crangon septemspinosa</i>	Common														X
Sargus fasciatus <i>Sargus fasciatus</i>	Common						X				X				
Scaphinotus elevatus <i>Scaphinotus elevatus</i>	Rare										X				
Scaphinotus viduus <i>Scaphinotus viduus</i>	Extirpated			X							X				
Scarlet Bluet <i>Enallagma pictum</i>	Rare		X				X	X		X	X				
Schinia spinosae <i>Schinia spinosae</i>	Locally			X											
Scribbled Sallow <i>Lepidolys perscripta</i>	Uncommon														
Scrub Euchlaena <i>Euchlaena madusaria</i>	Rare	X					X			X			X		
Seaside Goldenrod Stem Borer <i>Papaipema duovata</i>	Uncommon														
Sedge Skipper <i>Euphyes dion</i>	Rare		X				X	X		X	X	X	X		
Shore Shrimp <i>Palaemonetes spp.</i>	Occasional														
Silvery Checkerspot <i>Chlosyne nycteis</i>	Rare		X	X			X	X	X	X	X	X	X		
Skillet Clubtail <i>Gomphus ventricosus</i>	Rare						X	X		X	X				
Ski-tailed Emerald <i>Somatochlora elongata</i>	Rare									X	X				
Sleepy Duskywing <i>Erynnis brizo</i>	Uncommon														
Slender Clearwing <i>Hemaris gracilis</i>	Rare														
Slender Walker <i>Pomatiopsis lapidaria</i>	Uncommon														
Soft Shell Clam <i>Mya arenaria</i>	Occasional														

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates
Sparkling Jewelwing <i>Calopteryx dimidiata</i>	Rare						X	X		X	X				
Spartina Borer Moth <i>Spartiniphaga inops</i>	Locally														
Spider Crab <i>Libinia emarginata</i>	Abundant														
Spongillafly <i>Sisyra fuscata</i>	Unknown														
Spotted Dart <i>Agrotis stigmosa</i>	Extirpated		X				X	X		X	X	X	X		
Starfish spp. <i>Asteriid spp.</i>	Common														
Stonemyia isabellina <i>Stonemyia isabellina</i>	Occasional		X							X	X				
Tabanus fulvicallus <i>Tabanus fulvicallus</i>	Rare						X	X			X				
Tetragonoderus fasciatus <i>Tetragonoderus fasciatus</i>	Uncommon									X					
Tidewater Mucket <i>Leptodea ochracea</i>	Uncommon						X								
Tiger Spiketail <i>Cordulegaster erronea</i>	Rare						X	X		X					
Turret Snail <i>Valvata tricarinata</i>	Rare			X											
Two-spotted Skipper <i>Euphyes bimacula</i>	Rare		X				X	X		X	X	X	X		
Violet Dart Moth <i>Euxoa violaris</i>	Rare														
Virginia River Snail <i>Elimia virginica</i>	Uncommon														
Walker's Tusked Sprawler <i>Anthopotamus verticis</i>	Occasional						X			X	X		X		
Whiteriver Crayfish <i>Procambarus acutus</i>	Common														
Woodland Pondsail <i>Stagnicola catascopium</i>	Uncommon														
Yellow Bog Anarta <i>Anarta luteola</i>	Rare		X							X	X	X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	Abundance	Needs Research	Imperiled	Declining	Endemic	Disjunct	Vulnerable	Small – At Risk Pop	Limited Dispersal	Fragmented/ Isolated	Experts Concerned	Focal Spp	Indicator	Resp. Spp	Congregates	
Yellow Lampmussel <i>Lampsilis cariosa</i>	Extirpated															
Yellow-horned Beaded Lacewing <i>Lomamyia flavicornis</i>	Rare															
Zale curema <i>Zale curema</i>	Rare															
Zale obliqua <i>Zale obliqua</i>	Uncommon															
Zale submediana <i>Zale submediana</i>	Extirpated															

Appendix 1d: Priority Bird Species – Status, Threats, Actions

This appendix is a compilation of all migratory bird plans relevant to Connecticut for the CWCS. It was prepared through partnership with USFWS Region 5 (R5). Information is provided on the status of migratory birds of concern on state, regional, and national levels, as well as threats to these birds and their habitats, and the actions required to address these threats. Monitoring recommendations also are listed. The appendix describes additional opportunities for monitoring and adaptive management. Elements 1-7 are addressed for bird conservation.

Species names denoted with an asterisk were added from existing databases (NAWMP, PIF, MANEM Working Group, North Atlantic Shorebird Working Group), and recommendation from regional biologists. These species do NOT have conservation actions listed in this appendix. The column headings B, M and W stand for breeding, migrating and wintering respectively.

COASTAL

Species	B	M	W	Species	B	M	W
Black Duck*	X	X	X	Greater Scaup*		X	X
Black Scoter*		X	X	Herring Gull*	X		X
Black Tern		X		Horned Grebe*		X	
Bufflehead*		X	X	Least Tern*	X		
Common Eider*			X	Long-tailed Duck*		X	X
Common Goldeneye*		X	X	Red Phalarope*		X	
Common Loon*		X	X	Red-necked Phalarope*		X	
Common Tern	X			Red-throated Loon			X
Double-crested Cormorant*	X		X	Roseate Tern	X	X	
Great Black-backed Gull	X		X	Surf Scoter*		X	X

Threats

- Climate change/sea level rising
- Wind power facilities
- Oil/contamination spills
- Disease
- Entanglement (fishing lines and nets)

Actions

1. Protect and maintain high priority habitats.

Identify high priority habitats.	This is done—needs to be written. (S. Atlantic Migratory Bird Initiative)
----------------------------------	---

2 . Maintain or enhance populations of focal species.

Monitor breeding and non-breeding populations of focal species to determine population size, status, and trends.	<ul style="list-style-type: none"> ○ Monitor death and morbidity of seabirds. (S. Atlantic Migratory Bird Initiative) ○ Identify and monitor important foraging, wintering, and migrating areas. (S. Atlantic Migratory Bird Initiative) ○ Develop and implement a strategy to monitor colonial birds. (MANEM Regional Working Group) ○ Increase monitoring of seabird bycatch. (S. Atlantic Migratory Bird Initiative) ○ Determine population level effects of oil and hazardous materials on birds. (S. Atlantic Migratory Bird Initiative) ○ Determine effects of sargassum harvest to seabird habitat and populations. This is done—needs to be written. (S. Atlantic Migratory Bird Initiative) ○ Study the role of commercial fisheries in seabird mortality. (S. Atlantic Migratory Bird Initiative) ○ Implement surveys to determine population size of all species.
Decrease human disturbance/threats.	<ul style="list-style-type: none"> ○ Develop partnerships with fishery industries and sport anglers. (S. Atlantic Migratory Bird Initiative) ○ Partner with fishery planners to include reduced seabird mortality strategies in all future plans. (S. Atlantic Migratory Bird Initiative) ○ Implement increased enforcement of shipping activities, safe operational procedures, spill clean-up, and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative) ○ Prohibit and enforce dumping of debris, lines, and nets. (S. Atlantic Migratory Bird Initiative) ○ Develop non-persistent lines, nets and traps. (S. Atlantic Migratory Bird Initiative) ○ Fund and appoint state colonial waterbird coordinator. (S. Atlantic Migratory Bird Initiative)

Species Specific Objectives

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Black Tern		Regional threats include: habitat alteration/degradation, nests can be easily washed away by increased water levels, decline in water quality and pesticides affecting food sources.
Common Tern	Maintain current population of 4,121 pairs (10 colonies). (Tern Management Handbook)	<p>Important common tern sites include: Falkner Island, Bluff Island, Gull Rock, Shore Rock, and Tuxis Island. (Falkner and Bluff Island continuously occupied since 1980)</p> <p>To maintain and further enhance nesting colonies:</p> <ul style="list-style-type: none"> ○ Decrease human disturbance. ○ Research needs include information about foraging habitat, winter habitat and relationship between forage fish abundance and availability. ○ Maintain successful management techniques including: fencing, vegetation control, predator control, sign posting, wardens and education programs. (Tern Management Handbook)
Great Black-backed Gull	Over 45 sites have been survey. Population numbers range from 2 individuals to over 400 individuals. (Waterbird Monitoring Partnership http://www.mp2-pwrc.usgs.gov/cwb/Retrieval/CustSpecies/Search_Action.cfm for list)	Threats include: human disturbance, susceptible to oil contamination and aircraft collisions.
Red-throated Loon		Threats include: human disturbance, susceptible to oil contamination, collisions with wires and wind facilities, and human disturbance.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Roseate Tern	<p>At the 2001 census, 95 pairs were observed.</p> <p>Maintain current population on Falkner Island. Population considered stable (Tern Management Handbook) but too few colonies exist.</p> <p>See Recovery Plan</p>	<p>Between 1989-and 2001, Falkner Island has been the only nesting site for this species. The biggest issue on the island is erosion. Successful management techniques at nesting islands include:</p> <ul style="list-style-type: none"> ○ Restoration of historical sites using social attraction, vegetation control, predator control, nest shelters, artificial nest habitat, sign posting, wardens, education programs, and law enforcement. (Tern Management Handbook) ○ Continue research foraging habitat, migration routes, winter habitat use, protection and management.

MARITIME MARSH, ESTUARIES AND BAYS

Species	B	M	W	Species	B	M	W
American Bittern	X		X	Lesser Yellowlegs		X	
American Coot*		X	X	Little Blue Heron	X		
American Oystercatcher	X			Northern Pintail*		X	X
Black Duck*	X	X	X	Pectoral Sandpiper*		X	
Black Rail*	X			Red Knot		X	
Black Scoter*		X	X	Red-throated Loon*			X
Black Tern*		X		Roseate Tern	X	X	
Black-bellied Plover		X	X	Saltmarsh Sharp-tailed Sparrow	X		
Blue-winged Teal*	X	X	X	Sanderling		X	X
Bufflehead*		X	X	Seaside Sparrow*	X		X
Canada Goose (N. Atlantic pop'l)*		X	X	Semipalmated Sandpiper	X	X	
Canvasback*			X	Short billed Dowitcher		X	
Clapper Rail*	X			Short-eared Owl*		X	X
Common Goldeneye*		X	X	Snowy Egret	X		X
Common Loon		X	X	Spotted Sandpiper	X	X	
Common Tern	X			Stilt Sandpiper*		X	
Glossy Ibis	X			Surf Scoter*	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	B	M	W	Species	B	M	W
Great Egret	X			Tricolored Heron*	X		
Greater Scaup*		X	X	Whimbrel		X	
Green Heron	X			White-rumped Sandpiper		X	
Herring Gull*	X		X	Willet*	X	X	X

Threats

- Human disturbance
- Pollution
- Increasing predator populations
- Exotic species
- Entanglement (fishing lines and nets)
- Disease

Actions

1. Protect and maintain high priority habitats.

<p>Identify priority habitats for protection.</p>	<ul style="list-style-type: none"> ○ Create a patch-based, GIS system for evaluating priority habitats. (BCR 30 workshop) ○ Implement a region-wide habitat identification and ownership analysis; collect ownership/contact information (BCR 30 workshop). This project has been completed—refer to http://fsweb.wm.edu/ccb/habitat/habitat_home.cfm ○ Research the best method of protection—acquisition, fee or easements from willing sellers. ○ Implement a Landowner Information/Incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop) ○ Maintain and coordinate habitat protection of areas already owned by federal, state, local government or NGO's. ○ Create and restore habitat in focus areas through manipulation, augmentation, etc. ○ Protect marshes from chemical contamination, siltation, eutrophication, and other forms of pollution. ○ Train land managers to manage habitat for shorebirds by increasing the number of Manomet habitat management workshops. (MANEM working group)
---	--

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<p>Implement the best management practices at all appropriate impoundments.</p>	<ul style="list-style-type: none"> ○ Develop and implement a program for adaptive impoundment management in the Northeast in cooperation with the project underway in the southeast. (BCR 30 workshop) ○ Develop a list of all managed impoundments; include contact information and request that managers participate in achieving regional goals for managed wetland area. (BCR 30 workshop) ○ Incorporate shorebird management at all appropriate impoundments. (BCR 30 workshop) ○ Restore high marsh areas that have been flooded for impoundments in order to provide additional habitat for Saltmarsh Sharp-tailed Sparrows. (PIF)
<p>Restore degraded habitat.</p>	<ul style="list-style-type: none"> ○ Assess habitat quality for foraging shorebirds through resource or energetic studies in representative habitats throughout the BCR. (BCR 30 workshop) ○ Continue or develop and implement invasive species removal program. ○ Conduct vegetation studies. (MANEM working Group) ○ Restore Norwalk Island. (MANEM working Group)
<p>Plan for oil spill response.</p>	<ul style="list-style-type: none"> ○ Implement planning and simulations or partner with those that are currently participating in these types of activities. (MANEM working group) ○ Monitor and quantify habitat and food resources prior to spill as preparation for quantifying the direct and indirect impacts of a spill. (MANEM working group) ○ Implement post spill surveys to accurately quantify spill damages. (MANEM working group) ○ Effects on birds should be minimized by increased enforcement of shipping activities, safe operational procedures, spill clean up and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative)
<p>Secure adequate upland buffers (drier habitats adjoining wet marsh areas), especially for marshes near agricultural lands and human development. (PIF)</p>	<ul style="list-style-type: none"> ○ Identify landowners with upland buffers. ○ Determine the best protection method—acquisition, fee, easement. ○ Initiate landowner contact.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

2. Maintain or enhance populations of high priority species.

<p>Monitor breeding and non-breeding populations of focal species to determine population size, status, and trends.</p>	<ul style="list-style-type: none"> ○ Participate in the implementation of the Program for Regional and International Shorebird Monitoring (PRISM). ○ Develop and implement a regional monitoring program targeting coastal marshes in order to track population trends and estimate population sizes for all groups of birds. ○ Design and conduct a coordinated aerial survey, targeting migrating shorebirds in spring. (BCR 30 workshop) ○ Develop a targeted monitoring program for high priority shorebird species, including staging and migration sites (coordinate with PIF projects). (BCR 30 workshop) ○ Monitor shorebirds for responses to current management practices. (BCR 30 workshop) ○ Analyze threats to priority shorebird sites. (BCR 30 workshop) ○ Study how land-use practices such as: ditching, impounding, dredging, open marsh water management, burning, and marsh restoration impact species in this suite (especially sparrows and rails) to determine optimal habitat management practices. (PIF) ○ Conduct studies of productivity and survival of sparrow and rail populations across the planning unit to understand factors regulating population size and persistence. (PIF) ○ Investigate possible negative impacts that rising ocean levels, from global climate change, could have on marsh-nesting species. (PIF) ○ Conduct rail research-abundance and distribution. (MANEM Working Group and BCR 30 workshop) ○ Support existing studies on disease. (BCR 30 workshop)
<p>Develop appropriate predator control programs, especially for smaller marshes and marshes near human population concentrations.</p>	<ul style="list-style-type: none"> ○ Expand existing beach nesting bird protection programs to increase shorebird roosting. ○ Maintain breeding season exclosures and monitor their effectiveness. (BCR 30 workshop) ○ Partner with the Atlantic Flyway to manage adverse effects of Mute Swans. (BCR 30 workshop)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<p>Eliminate or reduce human disturbance.</p>	<ul style="list-style-type: none"> ○ Research, assess, and implement control programs for mammalian and avian predators for high priority beach nesting birds. (BCR 30 workshop) ○ Develop and implement outreach projects to reduce human disturbance. (BCR 30 workshop) ○ Partner with existing organizations to enhance efforts. ○ Increase law enforcement at protected sites. ○ Increase agency capacity focused on permit and technical assistance for shorebird, landbird, and waterbird species. ○ State agencies should fund incentives or measures to eliminate waterbird bycatch; a specific suggestion for the mid-Atlantic is to buy out gill-net fisheries. (BCR 30 workshop) ○ Fund independent assessment for addressing effects of bird strikes at wind power facilities. (BCR 30 workshop) ○ Encourage local planning (e.g., rolling setbacks and other tools) to ensure important breeding and non-breeding habitat is not affected by sea level rise due to climate change. (BCR 30 workshop) ○ Develop partnerships with the fishery industry and sport anglers. (S. Atlantic Migratory Bird Initiative) ○ Encourage state fishery programs to include impacts to birds in future fishery plans. (S. Atlantic Migratory Bird Initiative) ○ Appoint a state colonial waterbird coordinator. (S. Atlantic Migratory Bird Initiative)
<p>Assess impacts of aquaculture on shorebirds in all states where significant activity is underway, and predict probable impacts of proposed aquaculture development.</p>	<ul style="list-style-type: none"> ○ Conduct an immediate analysis of current threats to shorebirds from ongoing aquaculture projects. (BCR 30 workshop) ○ Ensure that an appropriate staff person from each state is involved with the aquaculture regulatory process. (BCR 30 workshop) ○ Develop Best Management Practices for aquaculture that minimizes impacts to shorebirds. (BCR 30 workshop)
<p>Incorporate protection of priority species into oil spill response plans.</p>	<ul style="list-style-type: none"> ○ Coordinate with appropriate partners. ○ Identify key tern foraging sites, prey base and stocks. (MANEM working group) ○ Effects on birds should be minimized by increase enforcement of shipping activities, safe operational procedures, spill clean-up and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species Specific Objectives

Species	Population Objective	Habitat Objective
American Bittern	Historic and current populations unknown. (MANEM Regional Working Group)	<p>Threats include: habitat loss and degradation due to drainage, filling, and conversion to agriculture, pesticides/contaminants, acid precipitation, hunting, human disturbance, and parasitic nematode can be contracted. (MANEM Working Group)</p> <p>Management recommendations:</p> <ul style="list-style-type: none"> ○ Conduct surveys to gather population numbers and distribution. ○ Preservation of priority saltmarsh and freshwater wetland habitats where species occurs. ○ Protection from chemical contamination and pollution. ○ Increase populations at protected/managed sites.
American Oystercatcher	Observed pairs are very low, ranging from 1-6 pairs at various sites. (USFWS Waterbird Monitoring Partnership) Maintain and enhance current populations.	<p>Menunketesuck Island is one of eight sites that this species has been observed on. (Waterbird Monitoring Partnership)</p> <p>Threats include: human/dog disturbance, predation, pollution, turbidity and habitat degradation.</p> <p>Management should include:</p> <ul style="list-style-type: none"> ○ Maintain successful management techniques including: fencing, predator control, sign posting, wardens and education programs. ○ Acquisition, or some form of protection, of highest priority parcels is critical.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Black-bellied Plover	<p>The latest survey on Sandy Point and Morse Point counted 300 individuals. (International Shorebird Survey maximum count data).</p> <p>The latest survey on Milford Pointed counted 500 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Menunketesuck Island counted 73. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Four sites have been identified as important for this species: Sandy Point, Morse Point, Milford Point, and Menunketesuck Island -primary stopover habitat. (A Plan for Monitoring Shorebirds During Non-breeding Season-Draft)</p> <p>See lesser yellowlegs for guidance on habitats.</p>
Common Loon	Wintering areas along the coast need protection from: oil spills, entanglement and pollutants.	
Common Tern	See Coastal habitat for objectives.	
Glossy Ibis	<p>Five islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these populations:</p> <ul style="list-style-type: none"> ○ Chimon Island-average 20 individuals ○ Duck Island-14 individuals ○ Ram Island-2 individuals ○ Shea Island-average 20 individuals ○ Tuxis Island-16 individuals <p>(These numbers reflect the most current survey date. Averages are from multiple surveys for same year).</p>	<p>Threats include: pesticides, oil spill, degradation of habitat, and predation. Wetland preservation is critical for this species. (MANEM Working Group)</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Great Egret	<p>Eight islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these populations:</p> <ul style="list-style-type: none"> ○ Charles Island-8 individuals ○ Chimon Island-74 individuals ○ Cockenoe Island-5 individuals ○ Duck Island-10 individuals ○ Great Captain Island-95 individuals ○ Ram Island-14 individuals ○ Shea Island-2 individuals ○ Tuxis Island-12 individuals <p>(These numbers reflect the most current survey date.)</p>	<p>This species responds well to restoration of wetland habitats. Need to improve monitoring to determine population status. (MANEM Working Group)</p>
Green Heron	<p>Eight islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these populations:</p> <ul style="list-style-type: none"> ○ Chimon Island-8 individuals ○ Duck Island-2 individuals ○ Great Meadows-10 individuals ○ Lewis Island-2 individuals ○ Ram Island-14 individuals ○ Shea Island-2 individuals ○ Sumac Island-2 individuals ○ Tuxis Island-10 individuals <p>(These numbers reflect the most current survey date.)</p>	<p>Primary concern is conservation and management of wetlands and should involve species' foraging/habitat needs. Some man-made water bodies have created suitable artificial habitat, such as reservoirs, water marshes used for mosquito control, and dredged material islands. (MANEM Working Group)</p>
Least Sandpiper	<p>The latest survey on Milford Point counted 300 individuals. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Milford Point is a primary stopover habitat. During nesting season, access to this area is limited due to federal ownership, but the island has become attached to the mainland, which may increase predation and disease. Partner with landowners to monitor sites and implement new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft.</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Lesser Yellowlegs	<p>The latest survey on Sandy Point and Morse Point counted 80 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Milford Pointed counted 35 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Menunketesuck Island counted 23 individuals. (International Shorebird Survey maximum count data).</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Four sites have been identified as important for this species. (A Plan for Monitoring Shorebirds During Non-breeding Season-Draft)</p> <ul style="list-style-type: none"> ○ <u>Sandy Point and Morse Point</u> - primary stopover habitat. Management issues include: habitats are very fragile and subject to hydrologic change; human disturbance: birders, anglers, dogs; species (plovers, terns, and other migrating shorebirds) are susceptible to predation. ○ Implement and conduct new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft. ○ <u>Milford Point</u> - primary stopover habitat. During nesting season, access to area is limited due to federal ownership, but the island has become attached to the mainland, which may increase predation and disease. ○ Partner with landowners to monitor sites and implement new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft. ○ <u>Menunketesuck Island</u> - primary stopover habitat. Management issues include: private ownership, and human and dog disturbance. ○ Research willingness of landowners for acquisition, fee, or easement. ○ Work with owners to reduce disturbance during critical times of migration.
Little Blue Heron	<p>Four islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these populations:</p> <ul style="list-style-type: none"> ○ Chimon Island-24 individuals ○ Cockenoe Island-2 individuals ○ Great Captain Island-1 individual ○ Shea Island-4 individuals <p>(These numbers reflect the most current survey date.)</p>	<p>Prohibit trespassing into heron colonies and surrounding buffer zones, especially during the breeding season. (MANEM regional working group)</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Red Knot	<p>The latest survey on Sandy Point and Morse Point counted 75 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Milford Pointed counted 54 individuals. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Three sites have been identified as important for this species: Sandy Point, Morse Point and Milford Point -primary stopover habitat. (A Plan for Monitoring Shorebirds During Non-breeding Season-Draft)</p> <p>See lesser yellowlegs for guidance on habitats.</p>
Roseate Tern	See Coastal habitat for objectives.	
Saltmarsh Sharp-tailed Sparrow	Due to lack of reliable population estimates, numerical objectives have not been determined.	Due to lack of reliable population estimates, numerical population and habitat-area objectives have not been determined. Protecting all remaining habitat, especially the largest patches, should receive high conservation attention.
Sanderling	<p>The latest survey on Sandy Point and Morse Point counted 400 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Milford Pointed counted 350 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Menunketesuck Island counted 175 individuals. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Four sites have been identified as important for this species: Sandy Point, Morse Point, Milford Point, and Menunketesuck Island - primary stopover habitat. (A Plan for Monitoring Shorebirds During Non-breeding Season-Draft)</p> <p>See lesser yellowlegs for guidance on habitats.</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Semipalmated Sandpiper	<p>The latest survey on Sandy Point and Morse Point counted 1500 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Milford Pointed counted 3000 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Menunketesuck Island counted 57 individuals. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	<p>Four sites have been identified as important for this species: Sandy Point, Morse Point, Milford Point, and Menunketesuck Island - primary stopover habitat. (A Plan for Monitoring Shorebirds During Non-breeding Season-Draft)</p> <p>See Lesser Yellowlegs for guidance on habitats.</p>
Short Billed Dowitcher		
Snowy Egret	<p>There is a renewed need for monitoring and research due to decreasing populations across part of the range. This species responds well to protective management measures.</p>	
Spotted Sandpiper		
Whimbrel		
White-rumped Sandpiper		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

BEACH, DUNE, AND ISLANDS

Species	B	M	W	Species	B	M	W
American Oystercatcher	X			Red Knot		X	
Black Skimmer	X			Roseate Tern	X	X	
Common Tern	X			Ruddy Turnstone		X	X
Great Black-backed Gull*	X		X	Sanderling		X	X
Herring Gull	X		X	Short-eared Owl*		X	X
Least Tern	X			Snowy Egret	X		X
Piping Plover	X			White-rumped Sandpiper		X	
Purple Sandpiper*			X				

Threats

- Human disturbance
- Nuisance/predator species
- Loss of habitat
- Flooding

Actions

1. Protect and maintain high priority habitats.

Identify priority habitats for protection.	<ul style="list-style-type: none"> ○ Create a patch-based, GIS system for evaluating priority habitats. (BCR 30 workshop) ○ Implement a region-wide habitat identification and ownership analysis; collect ownership/contact information. (BCR 30 workshop) ○ Research the best method of protection—acquisition, fee or easements from willing sellers ○ Implement Landowner Information/incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop) ○ Maintain and coordinate habitat protection of areas already owned by federal, state, local government or NGO's. ○ Train land managers to manage habitat for shorebirds by increasing the number of Manomet
--	---

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Restore degraded habitats.	<p>habitat management workshops. (MANEM working group)</p> <ul style="list-style-type: none"> ○ Continue to support state IBA Program. ○ Dredge material has been successfully used in some instances to create new habitat, especially for least terns and common terns, although all habitat alterations should be conducted with caution and after consultation with experts; new substrates should not be overly silty and depositions with over 20% shell material could interfere with nest construction. (PIF) ○ Utilize dredged material to implement erosion control efforts. (Tern Management Handbook) ○ Vegetation encroachment can degrade habitat for terns and should be prevented at important nesting sites. Addition of dredge spoils on vegetated beach areas may impede succession. (PIF) ○ Assess habitat quality for foraging shorebirds through resource or energetic studies in representative habitats throughout the BCR. (NAWCP workshop) ○ Continue or develop and implement invasive species removal program ○ Conduct vegetation studies and remove vegetation where it is deemed excessive with the appropriate tools (fire, hand-pulling, grazing, etc). (MANEM working Group and Tern Management Handbook) ○ Implement floating rafts where flooding threatens nesting species. (Tern Management Handbook) ○ Identify key areas for Phragmites control and target priority areas. (MANEM working group) ○ Compile current knowledge and assess impacts of beach replenishment and shoreline hardening on shorebirds. (BCR 30 workshop)
Identify and protect adequate buffers (inland and offshore).	<ul style="list-style-type: none"> ○ Identify landowners with upland buffers. ○ Determine the best protection method—acquisition, fee, easement. ○ Initiate landowner contact.

2. Maintain or enhance populations of high priority species.

Actively deter, reduce or eliminate predators.	<ul style="list-style-type: none"> ○ Use fences and other barriers to reduce predator impacts. ○ Implement predator control plans where they do not already exist. ○ Utilize predator control management techniques in the Tern Management Handbook.
--	---

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<p>Reduce or eliminate human disturbance.</p>	<ul style="list-style-type: none"> ○ Restrict access to nesting beaches during late May to late July. ○ Prohibit free-running dogs. ○ Post signs to alert and educate the public to presence of nesting birds. ○ Use fences and other barriers to reduce human impacts. ○ Protect breeding sites from habitat alteration and overuse from recreational activities, including night time activities. ○ Implement or utilize existing (partners) outreach opportunities to educate the public about their impacts to wildlife. (CT DEP program) ○ Increase law enforcement at sites with high human disturbance. ○ Increase outreach activities to gain support for protection of species. (Tern Management Handbook)
<p>Monitor breeding and non-breeding populations of focal species to determine population size, status and trends.</p>	<ul style="list-style-type: none"> ○ Participate in the implementation of the Program for Regional and International Shorebird Monitoring. (PRISM) ○ Design and conduct a coordinated aerial survey targeting migrating shorebirds in spring. (BCR 30 workshop) ○ Develop a targeted monitoring program for high priority shorebird species, including staging and migration sites (coordinate with PIF projects). (BCR 30 workshop) ○ Monitor shorebirds for responses to current management practices. (BCR 30 workshop) ○ Analyze threats to priority shorebird sites. (BCR 30 workshop) ○ Investigate possible negative impacts that rising ocean levels, from global climate change, could have on species. (PIF) ○ Support existing studies on disease. (BCR 30 workshop) ○ Continue to evaluate factors that limit populations of the priority species from this habitat suite and impede recovery, including studies of: (a) habitat requirements for breeding, foraging, and staging, (b) demographics, (c) causes of mortality, and (d) factors limiting the growth and survival of young. ○ Investigate the behavior and population ecology of predators impacting the priority bird species to provide a better understanding of how to protect the birds from depredation. ○ Investigate potential threats from pesticide and heavy metal accumulation. ○ Utilize monitoring techniques as stated in the Tern Management Handbook.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Plan for oil spill response.	<ul style="list-style-type: none"> ○ Implement planning and simulations or partner with those that are currently participating in these types of activities. (MANEM working group) ○ Monitor and quantify habitat and food resources prior to a spill as preparation for quantifying the direct and indirect impacts of a spill. (MANEM working group) ○ Implement post spill surveys to accurately quantify spill damages. (MANEM working group) ○ Effects on birds should be minimized by increased enforcement of shipping activities, safe operational procedures, spill clean-up and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative)
------------------------------	--

Species Specific Objectives

Species	Population Objective	Habitat Objective
American Oystercatcher	See oystercatcher in Maritime Marsh, Estuaries and Bays for objectives.	
Black Skimmer		<ul style="list-style-type: none"> ○ Threats include: flooding, predation, and human disturbance. ○ Protection of suitable breeding sites is crucial, especially considering the expansion of human populations and their attraction to coastal areas. ○ Large colonies can be protected by: restricting development, prohibiting the use of recreational vehicles in nesting areas, and through educating the public.
Common Tern	See common tern in Maritime Marsh, Estuaries and Bays for objectives.	
Herring Gull	Although populations have been declining due to oil pollution, pesticides, and food reduction from fishing, this species has been identified as a priority for its role as a predator to priority species in this habitat. Predator control efforts appear ineffective on a large scale, but have been successful in smaller colonies.	
Least Tern	From 1989-1998 least tern populations nested at only four sites. Maintain and enhance populations of 750 pairs (maximum count).	Four sites have been identified as extremely important: Griswold Point, Long Beach, Milford Point, and Sandy Point. While regional populations are likely increasing, colonies are very susceptible to human recreation and disturbance, and predation. Continued management for these problems is necessary.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Piping Plover	See the Piping Plover Recovery Plan: http://pipingplover.fws.gov/recplan/index.html	Threats include: human/dog disturbance, predation, and habitat degradation. Management recommendations: <ul style="list-style-type: none"> ○ Maintain successful management techniques including: fencing, predator control, sign posting, wardens and education programs.
Red Knot	See Maritime Marsh, Estuaries and Bays for objectives.	
Roseate Tern	See Coastal habitat for objectives.	
Ruddy Turnstone	<p>The latest survey on Sandy Point and Morse Point counted 100 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Milford Pointed counted 225 individuals. (International Shorebird Survey maximum count data)</p> <p>The latest survey on Menunketesuck Island counted 106 individuals. (International Shorebird Survey maximum count data)</p> <p>While impossible to give specific population objectives for non-breeders, implementing habitat objectives is recommended to provide suitable or improved habitat.</p>	See lesser yellowlegs for habitat objectives and management suggestions.
Sanderling	See maritime marsh for objectives.	
Snowy Egret	See maritime marsh for objectives.	
White-rumped Sandpiper		

FRESHWATER WETLAND/RIVER AND LAKE

Species	B	M	W	Species	B	M	W
American Bald Eagle*	X		X	Great Egret	X		X
American Bittern	X		X	Green Heron*	X		
American Woodcock*		X	X	Green-winged Teal*		X	X
Black Duck*	X	X	X	Herring Gull*	X		X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	B	M	W	Species	B	M	W
Black Rail*	X			Horned Grebe*		X	X
Black Tern*	X	X		Killdeer*	X	X	X
Black-crowned Night Heron*	X		X	King Rail*	X		
Blue-winged Teal*	X	X	X	Least Bittern*	X		
Canada Goose (N. Atlantic pop'l)*		X	X	Lesser Yellowlegs		X	
Canvasback*			X	Little Blue Heron*	X		
Clapper Rail	X			Mallard*	X	X	X
Common Loon		X	X	Semipalmated Sandpiper		X	
Common Snipe*	X	X	X	Snowy Egret	X		X
Double-crested Cormorant	X	X		Solitary Sandpiper		X	
Glossy Ibis	X			Spotted Sandpiper	X	X	

Threats

- Loss/alteration of habitat
- Contamination from various pollutants
- Invasive species

Actions

1. Protect and maintain high priority habitats.

<p>Identify priority habitats for protection.</p>	<ul style="list-style-type: none"> ○ Create a patch-based, GIS system for evaluating priority habitats (BCR 30 workshop) ○ Implement a region-wide habitat identification and ownership analysis; collect ownership/contact information (BCR 30 workshop) ○ Research the best method of protection—acquisition, fee or easements from willing sellers. ○ Implement a Landowner Information/incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop) ○ Preserve all large (> 10 ha) freshwater wetlands from development, draining, and other forms of habitat loss. (PIF) ○ Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during both the breeding and non-breeding seasons. (PIF)
---	--

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<p>Maintain and manage priority habitats already protected.</p>	<ul style="list-style-type: none"> ○ Coordinate habitat protection of areas owned by federal, state, local government or NGO's. ○ Continue to implement Wetland Protection regulations. ○ Investigate wetland management alternatives that can provide a variety of wetland habitat conditions that are suitable to the various needs of the priority species in this habitat suite. (PIF) ○ Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during both the breeding and non-breeding seasons. (PIF) ○ Develop and implement a program for adaptive impoundment management in the Northeast in cooperation with the project underway in the southeast. (BCR 30 workshop) ○ Design a regional management program for these wetland species that continue to be threatened by habitat loss, including increased coordination among managers and biologists to prevent duplication of research efforts and to share current information. ○ Creation of new nesting habitat may be needed for some species in this physiographic area. Minor alterations to existing management activities for waterfowl, such as leaving some dense stands of cattail and bulrush for nesting sites and maintaining fairly stable water levels during the nesting season, should benefit many of these species. Complete drying of impoundments during drawdowns should be avoided to prevent the die-off of small fish, amphibians, and dragonflies, which are all a major food sources for many of these bird species. Slow drawdowns should benefit bitterns by providing suitable foraging habitat and encouraging dense stands of emergent vegetation for nesting. (PIF)
<p>Reduce/eliminate wetland alteration and degradation.</p>	<ul style="list-style-type: none"> ○ Implement new and existing outreach efforts to the general public to gain support for wetland protection. ○ Wetlands used as breeding sites should be protected from chemical contamination, siltation, eutrophication, and other forms of pollution/contamination that could directly harm breeding birds or their food supply. (PIF) ○ Semi-marsh conditions favored by grebes and ducks need to be maintained by periodic reversal of vegetation succession to open up some of the extensive stands of emergent vegetation. Suitable habitat for nesting needs to be maintained in nearby areas during wetland management. (PIF)
<p>Reduce/eliminate invasive species.</p>	<ul style="list-style-type: none"> ○ Evaluate effects of invasive plants such as Phragmites and purple loosestrife. (PIF) ○ Work with partners to remove invasive species from infested priority habitats. ○ Coordinate with Invasive Plant Atlas of New England (IPANE) ○ (http://invasives.eeb.uconn.edu/ipane) and other invasive species groups for guidance on removal.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

2. Maintain and enhance populations of high priority species.

<p>Monitor breeding and non-breeding populations of focal species to determine population size, status and trends.</p>	<ul style="list-style-type: none"> ○ Develop a targeted monitoring program for high priority species. Coordinate with PIF projects. (BCR 30 workshop) ○ Utilize standard methods for conducting point-counts using tape-recorded vocalization playback. (PIF) ○ Determine the causes of breeding failure and mortality of young and adults. (PIF)
--	--

Species Specific Objectives

Species	Population Objective	Habitat Objective
American Bittern	See Maritime marsh, Estuary and Bay objectives.	
Clapper Rail		<ul style="list-style-type: none"> ○ Continued implementation of wetland protection laws is the most effective management technique for this species. (MANEM working Group) ○ Tidal restoration and open-marsh water management is necessary. Translocation to increase genetic variation of certain species has also been shown to be beneficial. (MANEM working Group)
Common Loon		<ul style="list-style-type: none"> ○ Breeding conservation programs and monitoring/protection of nesting sites in areas of human recreation are essential. (MANEM working Group) ○ Wintering areas along the coasts need protection from oil spills. (MANEM working Group)

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Double-crested Cormorant	<ul style="list-style-type: none"> ○ Populations are on the rise. ○ This species is hypothesized to have two potential effects on other colonial waterbird species: 1) competition for nest sites and 2) habitat degradation. Direct interspecific competition for nests and nest sites may occur but has not been documented through careful study. Most impacts appear to occur indirectly through habitat degradation (e.g. defoliation, tree die-off). While there is some evidence that they may displace other species, no studies have clearly established DCCO impact on other birds at even a colony level. To reduce cormorant impacts primarily to fisheries, aquaculture, vegetation and other colonial waterbirds, a large number of techniques has been developed or proposed. These techniques utilize lethal and non-lethal measures and may be used at local, regional or population levels. “Status of the double-crested cormorant (<i>Phalacrocorax auritus</i>) in North America”, USFWS document. 	
Glossy Ibis	See Maritime Marsh, Estuary, and Bay for objectives.	
Great Egret	<p>Eight islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these breeding populations:</p> <ul style="list-style-type: none"> ○ Charles Island-8 individuals ○ Chimon Island-74 individuals ○ Cockenoe Island-5 individuals ○ Duck Island-10 individuals ○ Great Captain Island-95 individuals ○ Ram Island-14 individuals ○ Shea island-2 individuals ○ Tuxis Island-12 individuals <p>(These numbers reflect the most current survey date)</p>	<p>Populations respond well to the protection of nesting and foraging sites and wetland restoration.</p> <p>Threats include: habitat loss, and ingestion of mercury and other chemicals / contaminants.</p> <p>(MANEM Regional Working Group)</p>
Lesser Yellowlegs	See Maritime Marsh, Estuary, and Bay for objectives.	
Semipalmated Sandpiper	See Maritime Marsh, Estuary, and Bay for objectives.	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Snowy Egret	<p>Eight islands have been surveyed for the Waterbird Monitoring Partnership over several years. Maintain/enhance these breeding populations:</p> <ul style="list-style-type: none"> ○ Charles Island-150 individuals ○ Chimon Island-462 individuals ○ Cockenoe Island-35 ○ Duck Island-22 individuals ○ Great Captain Island-100 individuals ○ Ram Island-40 individuals ○ Shea island-200 individuals ○ Tuxis Island-66 individuals <p>(These numbers reflect the most current survey date)</p>	<p>Populations respond well to the protection of nesting and foraging sites and wetland restoration. Threats include: vulnerability to pesticide contamination, ingestion of plastic and styrofoam, and loss/degradation of habitat.</p> <p>(MANEM Regional Working Group)</p>
Solitary Sandpiper		
Spotted Sandpiper		

MATURE DECIDUOUS/MIXED FOREST

Species	B	M	W	Species	B	M	W
American Woodcock*	X	X	X	Louisiana Waterthrush	X		
Baltimore Oriole*	X			Morning Dove*	X	X	X
Black-and-white Warbler*	X			Purple Finch*	X	X	X
Black-billed Cuckoo*	X			Rose-breasted Grosbeak*	X		
Blackburnian Warbler*	X			Scarlet Tanager*	X		
Black-throated Blue Warbler	X			Wood Duck*	X	X	X
Canada Warbler	X			Wood Thrush	X		
Cerulean Warbler	X			Worm-eating Warbler	X		
Kentucky Warbler*	X						

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Threats

- Edge effect
- Predation pressure
- Parasitism
- Fragmentation/habitat loss and alteration

Actions

1. Protect and maintain high priority habitats.

Identify priority habitats for protection.	<ul style="list-style-type: none"> ○ Create a patch-based, GIS system for evaluating priority habitats. (BCR 30 workshop) ○ Conduct land use analysis to identify all remaining large forest blocks (e.g., > 350 ha) and landscapes with high % forest cover. (e.g., > 70%). (PIF)
Target large forest blocks for protection. (PIF)	<ul style="list-style-type: none"> ○ Collect ownership/contact information. ○ Research the best method of protection—acquisition, fee or easements from willing sellers. ○ Implement Landowner Information/incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop)
Maintain and manage priority habitats already protected.	<ul style="list-style-type: none"> ○ Coordinate habitat protection of areas already owned by federal, state, local government or NGO’s. (BCR 30 workshop) ○ Create and restore habitat in focus areas through manipulation, augmentation, connecting smaller forest blocks to create large patches, etc. (PIF) ○ Assess vegetation structure to ensure that appropriate structural characteristics of the habitat are being maintained. (PIF) ○ If forest stands have reached a late-successional stage, but have little shrub or mid-canopy vegetation and few breaks in the canopy, low-level management through selective cuts or thinning may improve habitat conditions. (PIF) ○ Assess the effects of various logging practices (especially selection and shelterwood cuts) on occurrence, breeding density, and nesting success of the priority species in this habitat suite. (PIF) ○ Develop specific forest management guidelines for high priority species. (BCR 30 workshop) ○ Develop guidelines for recommended deer densities that are compatible with reversing declines of priority forest birds. (BCR 30 workshop)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

2. Maintain or enhance populations of high priority species.

<p>Monitor populations of focal species and species from the suite to determine population sizes, statuses, and trends.</p>	<ul style="list-style-type: none"> ○ Develop a targeted monitoring program for high priority species. Coordinate with PIF projects. (BCR 30 workshop) ○ Design and conduct a targeted monitoring program to track population trends of forest interior species that are not well covered by BBS in this physiographic area. (PIF) ○ Monitor reproductive success of this suite of species at different locations throughout the region to better understand where forest fragmentation causes problems and where it does not. (PIF) ○ Assess the sensitivity of species in this habitat suite to pesticides currently being used for control of gypsy moths and other insect pest species. (PIF) ○ Studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors are needed for most woodland raptors, including Cooper's hawk, barred owl, and red-shouldered hawk. (PIF) ○ Determine the relative importance and use of other habitat types during the post-fledging period prior to migration. (PIF)
---	--

Species Specific Objectives

Species	Population Objective	Habitat Objective
Black-throated Blue Warbler	<p>Current population estimates of this species, in the state of Connecticut, are 2,826 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be maintained.</p>	<p>9,410 hectares of suitable habitat are necessary to support current populations at an average density of 3.33 hectares per pair.</p>
Canada Warbler	<p>Current population estimates of this species, in the state of Connecticut, are 802 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 880 pairs.</p>	<p>2,931 hectares of suitable habitat are necessary to support 880 pairs at an average density of 3.33 hectares per pair.</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
Cerulean Warbler	<p>Current population estimates of this species, in the state of Connecticut are 80 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 88 pairs.</p>	<ul style="list-style-type: none"> ○ 352 hectares of suitable habitat are necessary to support 88 pairs at an average density of 4 hectares per pair. ○ Determine the range of suitable habitats and identify present breeding sites for cerulean warbler in this region; develop a better understanding of site conditions that attract these birds. (PIF)
Louisiana Waterthrush	<p>Current population estimates of this species, in the state of Connecticut, are 1,447 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 1,592 pairs.</p>	<ul style="list-style-type: none"> ○ 11,145 hectares of suitable habitat (i.e.: forested stream) are necessary to support 1,592 pairs at an average density of 7 hectares per pair. ○ Headwater streams and wetlands of high water quality within large forest patches should be the targeted habitat. In smaller forest tracts, maintain at least a 100-meter buffer of mature forest cover along streamside and ravine habitat. (PIF) ○ Conduct population ecology studies of species. (PIF)
Wood Thrush	<p>Current population estimates of this species, in the state of Connecticut, are 63,284 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 88,590 pairs.</p>	<ul style="list-style-type: none"> ○ 295,006 hectares of suitable habitat are necessary to support 88,590 pairs at an average density of 3.33 hectares per pair. ○ Selective logging and thinning of “overmature” trees may create favorable vegetation conditions. (PIF) ○ Determine factors limiting wood thrush populations in this region and causes of population declines. (PIF)
Worm-eating Warbler	<p>Current population estimates of this species, in the state of Connecticut, are 3,404 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 3,733 pairs.</p>	<ul style="list-style-type: none"> ○ 12,431 hectares of suitable habitat is necessary to support 3,733 pairs at an average density of 3.3 hectares per pair. ○ Selective logging and thinning of “overmature” trees may create favorable vegetation conditions. (PIF)

EARLY SUCCESSIONAL SHRUB/PITCH PINE BARRENS

Species	B	M	W	Species	B	M	W
American Woodcock	X	X	X	Olive-sided Flycatcher*	X		
Blue-winged Warbler	X			Prairie Warbler*	X		
Eastern Towhee	X			Red-headed Woodpecker*	X		
Golden-winged Warbler	X			Willow Flycatcher*	X		
Morning Dove*	X	X	X	Wood Duck*	X	X	X

Threats to Early Successional Shrub Habitat

- Urban/suburban development
- Habitat fragmentation
- Lack of adequate disturbance events in remaining forested areas

Threats to Pine Barrens

- Fire suppression
- Development pressures particularly for recreational activities
- Overuse associated with recreation
- Over-extraction or pollution of groundwater.

Actions

1. Protect and maintain high priority habitats. (Refer to PIF Physiographic Area 9 plan for a comprehensive discussion on management and implementation strategies)

Identify and protect high priority habitat.	<ul style="list-style-type: none"> ○ Create a patch-based, GIS system for evaluating priority habitats. (BCR 30 workshop) ○ Identify and protect all remaining pine barren habitat. ○ Collect ownership/contact information. ○ Research the best method of protection—acquisition, fee or easements from willing sellers ○ Implement Landowner Information/incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop) ○ Identify powerline rights-of-way to be managed to provide habitat for shrubland birds. (PIF)
---	--

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

<p>Maintain, manage and monitor priority habitats already protected.</p>	<ul style="list-style-type: none"> ○ Sustain habitat through collaborative management of areas that already are subjected to frequent human disturbance from agriculture, forestry, or the maintenance of roads and rights-of-way. (PIF) ○ Coordinate habitat protection of areas already owned by federal, state, local government or NGO's. (BCR 30 workshop) ○ Compare early successional habitats resulting from natural disturbances vs. forestry practices vs. power line rights-of-way with regard to suitability for high-priority species, including breeding densities and nesting success. (PIF) ○ Determine if there is relationship between patch size and nesting success for shrubland birds, and between patch size and breeding density for the more area sensitive species. (PIF) ○ Continue clear-cutting as a means of providing shrub habitat on state forests. (PIF) ○ Implement careful planning of rotational harvest schedules. (PIF) ○ Maintain right-of-ways by selectively spraying herbicide on the base of tall-growing trees. (PIF) ○ Develop and implement integrated management plans for grasslands on civilian and military airfields. (BCR 30 workshop)
--	---

2. Maintain or enhance populations of high priority species.

<p>Utilize existing programs to increase populations of grassland species.</p>	<ul style="list-style-type: none"> ○ Increase utilization of the Farm Bill programs to benefit priority grassland and shrubland birds. ○ Expand traditional game management in early successional habitats to include nongame bird priorities and objectives; including evaluation of the effects of traditional game management on priority nongame species.
<p>Monitor species to determine population size, status and trends.</p>	<ul style="list-style-type: none"> ○ Develop a targeted monitoring program for high priority species. Coordinate with PIF projects. (BCR 30 workshop) ○ Research/monitoring is needed on effects of cowbird parasitism on shrubland birds. (PIF) ○ Determine effects of woodcock habitat management techniques on other priority, early-successional bird species. (PIF) ○ Develop targeted monitoring/research program on demographics and habitat-area relationships for priority grassland birds building on, and expanding, the techniques developed by Massachusetts Audubon. (BCR 30 workshop)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species Specific Objectives

Species	Population Objectives	Habitat Objectives
American Woodcock	Maintain a stable breeding population; reverse recent population declines.	
Blue-winged Warbler	<p>Current population estimates of this species, in the state of Connecticut, are 9,039 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 12,656 pairs.</p>	<ul style="list-style-type: none"> ○ 20,249 hectares of suitable habitat is necessary to support 12,656 pairs at an average density of 1.6 hectares per pair. ○ Determine the range of suitable habitats and identify present breeding sites for golden-winged warblers and blue-winged warblers. Present breeding sites are being survey through the Golden-winged Warbler Atlas Project by the Lab of Ornithology, with field work being conducted for this project as of 2000. (PIF)
Eastern Towhee	<p>Current population estimates of this species, in the state of Connecticut, are 12,384 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 24,767 pairs.</p>	<ul style="list-style-type: none"> ○ 24,767 hectares of suitable habitat is necessary to support 24,767 pairs at an average density of 1 hectare per pair.
Golden-winged Warbler	<p>Current population estimates of this species, in the state of Connecticut, are 18 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 36 pairs.</p> <p>Analyze the effects of blue-winged warblers on recruitment, habitat selection, and nesting success of golden-winged warblers. (PIF)</p> <p>Further monitoring of cowbird parasitism rates and effects on reproductive success of golden-winged warblers is also needed. (PIF)</p>	<ul style="list-style-type: none"> ○ 144 hectares of suitable habitat is necessary to support 36 pairs at an average density of 4 hectares per pair. ○ Determine range of suitable habitats and identify present breeding sites for golden-winged warblers and blue-winged warblers. Present breeding sites are being survey through the Golden-winged Warbler Atlas Project by the Lab of Ornithology, with field work being conducted for this project beginning in 2000. (PIF) ○ Optimal management for this species would include rotational burning or intermittent farming. (PIF)

GRASSLAND/AGRICULTURE

Species	B	M	W	Species	B	M	W
Canada Goose (N. Atlantic pop'l)*		X	X	Sedge Wren*	X		
Grasshopper Sparrow	X			Upland Sandpiper	X		
Killdeer*	X	X	X	Wood Duck*		X	X
Mallard*	X	X	X				

Threats

- Loss of open land associated with declining farm practices including residential development and reversion to forest.

Actions

1. Protect and maintain high priority habitats. (Refer to PIF Physiographic Area 9 plan for a comprehensive discussion on management and implementation strategies)

Identify high priority habitats for protection.	<ul style="list-style-type: none"> ○ Identify and protect key areas, especially large grasslands, for immediate conservation efforts. (PIF) ○ Create a patch-based, GIS system for evaluating priority habitats. (BCR 30 workshop) ○ Collect ownership/contact information. ○ Research the best method of protection—acquisition, fee or easements from willing sellers ○ Implement Landowner Information/incentive Program (LIP) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop) ○ Determine if differences exist in grassland breeding bird diversity and abundance in the Northeast between warm season and cool season grass types. (PIF)
Maintain, manage and monitor priority habitats already protected.	<ul style="list-style-type: none"> ○ Coordinate with other states to develop and implement a comprehensive grassland management plan for the entire New England region. (PIF) ○ Mowing, burning, and controlled grazing can be used to maintain grasslands, but the most appropriate methods for each site must be carefully considered and input from regional grassland experts is strongly encouraged. (PIF) ○ Coordinate habitat protection of areas already owned by federal, state, local government, private

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	<p>landowners and NGO's. (BCR 30 workshop)</p> <ul style="list-style-type: none"> ○ Consider consolidation of adjacent grassland fields, through the elimination of hedgerows, stone fences, or tree lines, in areas where open land occupies a considerable amount of the surrounding landscape and grassland management can be identified as a reasonable management alternative. (PIF) ○ Implement a prescribed fire program where this management technique would be considered appropriate. (PIF) ○ Determine if current mixtures of warm season grasses has failed to provide adequate habitat for grassland breeding birds. Focus on cool season grasslands if needed. (PIF) ○ Implement a mowing program where appropriate. (PIF) ○ Continue monitoring grassland habitats within the physiographic area as part of a regional effort within New England to better assess grassland bird abundance trends. (PIF) ○ Further research different management techniques to understand the appropriate level of prescribed burning, mowing, and other methods for maintaining suitable habitat for Northeastern grassland birds. (PIF)
--	---

2. Maintain or enhance populations of high priority species.

<p>Monitor populations of focal species to determine population size, status and trends.</p>	<p>Conduct demographic studies (productivity, survival, dispersal) of priority species to provide information needed for determining causes of population declines and understanding metapopulation dynamics.</p>
--	---

Species Specific Objectives

Species	Population Objective	Habitat Objective
<p>Grasshopper Sparrow</p>	<p>Current population estimates of this species, in the state of Connecticut, are 35 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 70 pairs. (Grasshopper sparrow population estimate based on Grassland</p>	<p>280 hectares of suitable habitat is necessary to support 70 pairs at an average density of 4 hectares per pair.</p>

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species	Population Objective	Habitat Objective
	Bird Database)	
Upland Sandpiper	<p>Current population estimates of this species, in the state of Connecticut, are 8 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 15 pairs. (Upland sandpiper population estimate based on Grassland Bird Database)</p>	750 hectares of suitable habitat is necessary to support 15 pairs at an average density of 50 hectares per pair.

URBAN/SUBURBAN

Species	B	M	W	Species	B	M	W
Canada Goose (Resident pop'l)*	X	X	X	Killdeer*	X	X	X
Chimney Swift	X			Morning Dove*	X	X	X

Threats

- Changes in modern building construction
- Use of pesticides for mosquito control

Actions

1. Maintain and enhance populations of high priority species.

Monitor populations of focal species to determine population size, status and trends.	<ul style="list-style-type: none"> ○ Participate/establish a network of managers, biologists, and researchers across Southern New England to more effectively address the needs and coordinate conservation efforts for the high priority urban birds. (PIF) ○ Surveying efforts, identification of significant breeding locations, and public education/outreach should be coordinated on a regional basis. (PIF) ○ Develop an appropriate survey method for tracking populations of chimney swifts and common nighthawks and conduct a thorough status assessment of these species. (PIF)
---	--

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

	<ul style="list-style-type: none"> ○ Understand the impacts of pesticides (e.g., urban/suburban mosquito spraying) on this suite of species, including links to the current outbreak of West Nile virus. (PIF) ○ Assess life history information on these species, such as: identification of nest predators and levels of nest depredation, breeding longevity and reproductive effort over time, characteristics of preferred nesting requirements, fidelity to breeding and wintering sites, and further assessment of migration routes and destinations. (PIF)
--	--

Species Specific Objectives

Species	Population Objectives	Habitat Objectives
Chimney Swift (B)	<p>Current population estimates of this species, in the state of Connecticut are 22,710 pairs.</p> <p>To support the population objectives of the PIF plan, populations in the state of Connecticut should be increased to 31,795 pairs.</p>	<ul style="list-style-type: none"> ○ 59,774 hectares of suitable habitat is necessary to support 31,795 pairs at an average density of 1.88 hectares per pair. ○ Identify key breeding locations area for purple martins, chimney swifts, and common nighthawks for immediate conservation efforts. (PIF) ○ Landowner contacts should be made at each site to encourage proper management for these species. (PIF) ○ Distribute information materials on the use of rooftops and chimneys as nesting sites. (PIF) ○ Develop and implement public education programs to encourage reports on chimney swifts; develop urban public education in schools to aid in the monitoring and assessment of populations of these species. (PIF)

Appendix 1e: Compilation of Existing Conservation and Management Plans

This appendix lists the many species or taxa-focused conservation and management plans and reports in the technical literature that were compiled, analyzed, and referenced in this CWCS. These plans provide information on life history, abundance and status, distribution, threats and problems, conservation actions, monitoring, research needs, and adaptive management recommendations at state, local, regional, national and international levels. This appendix directly addresses Element 1, as well as Elements 5, 6, and 7.

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
MAMMALS										
Bats in Eastern Woodlands	Bats	Bat Conservation International (2001)		X	X	X	X	X	X	X
Conservation recommendations for Bats in Eastern Woodlands		Bat Conservation International (2001)		X	X	X	X	X	X	X
Deer Management Program	Deer	CT DEP		X	X	X	X	X	X	X
Furbearer Management Program	Furbearing mammals (bear, coyote, beaver, et al.)	CT DEP		X	X	X	X	X	X	X
Indiana Bat (<i>Myotis sodalis</i>) Revised Recovery Plan	Indiana bat	USFWS (1999)	X	X	X	X	X	X	X	X
North American Bat Conservation Partnership Strategic Plan	Bats	North American Bat Conservation Partnership (2004)	X	X	X	X	X	X	X	X
BIRDS										
Adaptive Harvest	Waterfowl	USFWS (2003b)		X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Management: 2003 Duck Hunting Season										
American Woodcock Management Plan	American woodcock	USFWS (1996b)	X	X	X	X	X	X	X	
American Woodcock Population Status 2003	American woodcock	USFWS Kelley (2003)	X	X	X	X	X	X	X	
Appalachian Cooperative Grouse Research Project Report. A Summary of Findings From Phase I of the Research Project, 1996-1999	Ruffed grouse	Ruffed Grouse Society Reynolds et al. (2000)	X	X	X	X	X	X	X	
Atlantic Coast Joint Venture Plan	Waterbirds	Milliken, A. (USFWS 2004)	X	X	X	X	X	X	X	X
Bird Conservation Region 14-- Atlantic Northern Forest	Birds in BCR 14	Dettmers, R. 2002	X	X	X	X	X	X	X	X
Bird Conservation Region 28-- Appalachian Mountains	Birds in BCR 28	Watson, K. USFWS 2004	X	X	X	X	X	X	X	X
Bird Conservation Region 30-- Southern New England/Mid-Atlantic Coast	Birds in BCR 30	Milliken, A. USFWS	X	X	X	X	X	X	X	X
Bird Conservation Strategic Plan	Birds	Audubon Connecticut Comins et al. 2004	X	X	X	X	X	X	X	X
Birds of Conservation Concern 2002	Birds	USFWS (2002)		X	X	X	X	X	X	
Blueprint for the Future of Migratory Birds	Birds	USFWS		X	X	X	X	X	X	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Cerulean Warbler Status Assessment, April 2000	Cerulean warbler	USFWS Hamel (2000)	X	X	X	X	X	X	X	X
Draft Partners in Flight Landbird Conservation Plan: Physiographic Area 09: Southern New England	Landbirds	Partners In Flight Dettmers and Rosenberg (2000)		X	X	X	X	X	X	X
Ducks Unlimited Conservation Plan		Ducks Unlimited		X	X	X	X	X	X	
Ducks Unlimited Conservation Plan: Meeting the Annual Life Cycle needs of North America's Waterfowl	Waterfowl	Ducks Unlimited (2001)		X	X	X	X			X
Effects of Management Practices on Grassland Birds (series)	Grassland birds	USGS Dechant et al. (2003)	X	X	X	X	X	X	X	X
Expanding the Vision: 1998 Update, North American Waterfowl Management Plan	Waterfowl	USFWS (1998)		X	X	X	X	X	X	X
Grasslands Bird Plan		Connecticut Audubon	X	X	X	X	X	X	X	
Landbird Conservation Plan for Northern New England (Area 27)		Partners In Flight	X	X	X	X	X	X	X	
Landbird Conservation Plan for Southern New England (Area 09)		Partners In Flight	X	X	X	X	X	X	X	
Least Tern Plan		Connecticut Ornithological Association (COA)	X	X	X	X	X	X	X	
Management Recommendations for Marshbirds (Summary from the Marshbird Conservation Workshop)	Marshbirds	USFWS (2001)		X	X	X	X	X	X	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Mid-Atlantic/New England Maritime Regional Working Group for Waterbirds	Waterbirds in BCR 14 and 30 and Large Marine Ecoregions 7 and 8	Johnston, S. (2004)	X	X	X	X	X	X	X	X
Migratory Gamebird Program	Gamebirds (waterfowl, wood duck, woodcock, et al.)	CT DEP	X	X	X	X	X	X	X	X
North American Bird Conservation Initiative	all bird species	USFWS, International Association of Fish and Wildlife Organizations, American Bird Conservancy, Partners in Flight, Ducks Unlimited, Wildlife Management Institute, National Flyway Council, Federal Agency Subcommittee USDA Forest Service International Programs, Association of Joint Venture Management Board Chairs, Resident	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
		Game Bird Working Group								
North American Landbird Conservation Plan – BCR 14 Atlantic Northern Forest		Partners In Flight	X	X	X	X	X	X	X	X
North American Landbird Conservation Plan – BCR 28 Appalachian Mountains		Partners In Flight	X	X	X	X	X	X	X	X
North American Landbird Conservation Plan – BCR 30 New England/Mid-Atlantic Coast		Partners In Flight	X	X	X	X	X	X	X	X
North American Waterbird Conservation Plan	Waterbirds	Johnston, S. (2004)	X	X	X	X	X	X	X	X
North American Waterfowl Management Plan	Waterbirds	USFWS (1998)	X	X	X	X	X	X	X	X
Northern Atlantic Regional Shorebird Plan	Shorebirds	Clark and Niles (2000)	X	X	X	X	X	X	X	X
Partners in Flight continental priorities and objectives defined at the state and bird conservation region levels	Birds in need of conservation	Rosenberg (2004)	X	X	X	X	X	X	X	X
Partners in Flight Landbird Conservation Plan: Physiographic Area 27: Northern New England	Landbirds	Partners In Flight Hodgman and Rosenberg (2000)		X	X	X	X	X	X	X
Partners in Flight North American Landbird Conservation Plan	Landbirds	Partners In Flight Rich et al. (2004)		X	X	X	X	X	X	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Piping Plover (<i>Charadrius melodus</i>), Atlantic Coast Population, Revised Recovery Plan	Piping plover	USFWS (1996)	X	X	X	X	X	X	X	X
Population Decline of the Least Tern (<i>Sterna antillarum</i>) in Connecticut: Possible Causes and Remedial Actions	Least tern	Connecticut Ornithological Association Stevenson (2003)	X	X	X	X	X		X	
Program for Regional and International Shorebird Monitoring	Shorebirds	USGS	X	X	X	X	X	X	X	X
Protecting Connecticut's Grassland Heritage: A Report of the Connecticut Grasslands Working Group	Grassland birds	Audubon Connecticut Comins et al. (2003)		X	X	X	X	X	X	
Roseate Tern (<i>Sterna dougallii</i>) Northeastern Population Recovery Plan	Roseate tern	Northeast Roseate Tern Recovery Team USFWS (1998)	X	X	X	X	X	X	X	X
South Atlantic Migratory Bird Initiative	Migratory Birds	USFWS		X	X	X	X	X	X	
Tern Management Handbook, Coastal Northeastern United States and Atlantic Canada	Terns	USFWS, Canadian Wildlife Service, and National Audubon Society Kress and Hall (2002)	X	X	X	X	X	X	X	X
Trends in Duck Breeding Populations, 1955-2003	Waterfowl	USFWS Wilkines and Otto (2003)		X	X	X	X	X	X	

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
U.S. Shorebird Conservation Plan	Shorebirds	Brown et al. (2001)		X	X	X	X	X	X	X
Waterbird Conservation for the Americas: The North America Waterbird Conservation Plan	Colonial waterbirds	Kushlan et al. (2002)		X	X	X	X	X	X	X
Waterbird Monitoring Partnership	Waterbirds	USGS		X	X	X	X	X	X	
Wild Turkey Management Program	Turkey	CT DEP		X	X			X		X
HERPETOFAUNA										
Amphibians and Reptiles in Connecticut: A Checklist with Notes on Conservation Status, Identification, and Distribution	Herpetofauna	CT DEP Klemens (2000)	X	X	X	X	X	X	X	X
Best Management Practices for conserving pool-breeding amphibians		Calhoun and Klemens (2002); Natural Resources Conservation Service (NRCS)	X	X	X	X	X	X	X	
Bog Turtle (<i>Clemmys muhlenbergii</i>), Northern Population, Recovery Plan	Bog turtle	USFWS (2001)	X	X	X	X	X	X	X	X
Conserving Amphibians And Reptiles In The New Millennium		PARC (1999)	X	X	X	X	X	X	X	X
Habitat Management Guidelines for Amphibians and Reptiles of the Midwest	Reptiles and amphibians	PARC Kingsbury and Gibson (2002)	X	X	X	X	X	X	X	X
Habitat Management Guidelines for Amphibians and Reptiles of the	Reptiles and amphibians	PARC Breisch and Mitchell	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Northeastern United States		(2004)								
Habitat Management Guidelines for Amphibians and Reptiles of the Southeastern United States	Reptiles and amphibians	PARC Bailey et al. (2004)	X	X	X	X	X	X	X	X
Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico	Hawksbill (sea) turtle	NMFS and USFWS (1993)	X	X	X	X	X	X	X	X
Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico	Leatherback (sea) turtle	NMFS and USFWS (1992)	X	X	X	X	X	X	X	X
Recovery Plan for the Kemp's Ridley Sea Turtle (<i>Lepidochelys kempii</i>)	Kemp's Ridley sea turtle	USFWS and NMFS (1992)	X	X	X	X	X	X	X	X
Recovery Plan for U.S. Population of Atlantic Green Turtle	Green (sea) turtle	NMFS and USFWS (1991a)	X	X	X	X	X	X	X	X
Recovery Plan for U.S. Population of Loggerhead Turtle	Loggerhead (sea) turtle	NMFS and USFWS (1991b)	X	X	X	X	X	X	X	X
FISH										
A Management Plan for Bass in Connecticut Waters and Recommendations for Other Warmwater Species	Bass and warm freshwater fishes	CT DEP, Inland Fisheries Division; Jacobs et al. (1999)	X	X	X	X	X	X	X	X
A Marine Resources Management Plan for the State of Connecticut	Marine fish	CT DEP, Marine Fisheries Division; Blake and Smith (1984)	X	X	X	X	X	X	X	X
A Trout Management Plan for	Trout	CT DEP, Inland	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Connecticut's Rivers and Streams		Fisheries Division; Hyatt et al. (1999)								
Atlantic Herring Fishery Management Plan	Atlantic sea herring	NEFMC (1999, 2003a), ASMFC (1999a)	X	X	X	X	X	X	X	X
Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan	Atlantic mackerel, Long-finned squid, Short-finned squid, butterfish	MAFMC (1983)	X	X	X	X	X	X	X	X
Atlantic Salmon Fishery Management Plan	Atlantic salmon	NEFMC (2003b)	X	X	X	X	X	X	X	X
Atlantic Sea Scallop Fishery Management Plan	Atlantic sea scallop	NEFMC (2003c)	X	X	X	X	X	X	X	X
Atlantic Surfclam and Ocean Quahog Fishery Management Plan	Atlantic surfclam, Ocean quahog	MAFMC (1977)	X	X	X	X	X	X	X	X
Bass Management Plan	Bass	CT DEP, Inland Fisheries Division	X	X	X	X	X	X	X	X
Bluefish Fishery Management Plan	Bluefish	MAFMC (1984)	X	X	X	X	X	X	X	X
Deep-Sea Red Crab Fishery Management Plan	Red crab	NEFMC (2003d)	X	X	X	X	X	X	X	X
Essential Fish Habitat (EFH) Strategic Plan		National Marine Fisheries Service	X	X	X	X	X	X	X	X
Final Recovery Plan for the	Shortnose	NMFS (1998)	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Shortnose Sturgeon	sturgeon									
Fishery management plan for American shad in the Connecticut River	American shad	Crecco and Savoy (1987)	X	X	X	X	X	X	X	X
Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks	Tuna, swordfish, sharks	NMFS (2003)	X	X	X	X	X	X	X	X
Fishery Management Plan for Inshore Stocks of Winter Flounder	Winter flounder	ASMFC (1998b)	X	X	X	X	X	X	X	X
Fishery Management Plan for Tautog	Tautog	ASMFC (2002b)	X	X	X	X	X	X	X	X
Fishery Management Plans (groundfish complex, sea scallops, American lobster, et al.)		New England Fishery Management Council	X	X	X	X	X	X	X	X
Fishery Management Plans (summer flounder, scup, squid, bluefish, et al.)		Mid-Atlantic Fishery Management Council	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for American Eel	American eel	ASMFC (2000)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for American Lobster	American lobster	ASMFC (1997)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Atlantic Menhaden	Atlantic menhaden	ASMFC (2001)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Atlantic Striped Bass	Striped bass	ASMFC (2003)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan	Atlantic	ASMFC (1998a)	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
for Atlantic Sturgeon	sturgeon									
Interstate Fishery Management Plan for Horseshoe Crab	Horseshoe crab	ASMFC (1998c)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Northern Shrimp	Northern shrimp	ASMFC (2004)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Red Drum	Red drum	ASMFC (2002d)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Shad and River Herring	Shad, river herring	ASMFC (1999b)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Weakfish	Weakfish	ASMFC (2002c)	X	X	X	X	X	X	X	X
Interstate Fishery Management Plans (shad, river herring, horseshoe crab, et al.)		Atlantic States Marine Fisheries Commission	X	X	X	X	X	X	X	X
Long Island Sound Comprehensive Conservation and Management Plan	Fish, invertebrates	OLISP, CT DEP Long Island Sound Study (1994, 2004)	X	X	X	X	X	X	X	X
Management Plan for American Shad in the Connecticut River Basin	American shad	USFWS (1992) CT River Atlantic Salmon Commission	X	X	X	X	X	X	X	X
Monkfish Fishery Management Plan	Monkfish	NEFMC (2003e)	X	X	X	X	X	X	X	X
Northeast Multispecies (Large Mesh/Groundfish) Fishery Management Plan	Groundfish	NEFMC (2003f)	X	X	X	X	X	X	X	X
Northeast Multispecies (Small	Whiting	NEFMC (2003g)	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Mesh/Whiting) Fishery Management Plan										
Northeast Skate Complex Fishery Management Plan	Skates	NEFMC (2003h)	X	X	X	X	X	X	X	X
Spiny Dogfish Fishery Management Plan	Spiny dogfish	MAFMC and NEFMC (1999); ASMFC (2002a)	X	X	X	X	X	X	X	X
Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan	Summer flounder, scup, black sea bass	MAFMC (1988)	X	X	X	X	X	X	X	X
Tilefish Fishery Management Plan	Golden tilefish	MAFMC (2000)	X	X	X	X	X	X	X	X
Trout Management Plan		CT DEP, Inland Fisheries Division	X	X	X	X	X	X	X	X
INVERTEBRATES										
Connecticut Lobster (<i>Homarus americanus</i>) Population Studies	American lobster	CT DEP, Marine Fisheries Division (1983-2004)	X	X	X	X	X	X	X	X
Conservation recommendations for invertebrates		Xerxes Society	X			X	X	X	X	X
Dwarf Wedge Mussel (<i>Alasmidonta heterodon</i>) Recovery Plan	Dwarf wedge mussel	USFWS (1993)	X	X	X	X	X	X	X	
Northeastern Beach Tiger Beetle (<i>Cicindela Dorsalis Dorsalis</i> Say) Recovery Plan	Northeastern beach tiger beetle	USFWS (1994)	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
Puritan Tiger Beetle (<i>Cicindela puritana</i> G. Horn) Recovery Plan	Puritan tiger beetle	USFWS (1993)	X	X	X	X	X	X	X	X
OTHER										
Coastal and Estuarine Land Conservation Plan		CT DEP, Office of Long Island Sound Program (OLISP)				X	X	X		X
Comprehensive Conservation Plan		National Wildlife Refuge	X	X	X	X	X	X	X	X
Conservation and Development Policies Plan for Connecticut		CT Office of Policy and Management (OPM)			X	X		X		X
Ecoregional Conservation Plan for Lower New England-Northern Piedmont		The Nature Conservancy (TNC)	X	X	X	X	X	X	X	X
Ecoregional Conservation Plan for the North Atlantic Coast		The Nature Conservancy (TNC)	X	X	X	X	X	X	X	X
Environment/2000 (E/2000) Connecticut's Environmental Plan		CT Office of Planning and Development		X	X	X	X			
Farmington Valley Biodiversity Plan		Farmington River Watershed Association and the Metropolitan Conservation Alliance	X	X	X	X	X	X	X	X
Interstate Marine Fisheries Management	Commercially exploited marine finfish and	CT DEP, Marine Fisheries Division (1995-2004)	X	X	X	X	X	X	X	X

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
	lobsters									
Long Island Sound Management Plan		Environmental Protection Agency (EPA), CT DEP, et al.	X	X	X	X	X	X	X	X
Lower New England – Northern Piedmont Ecoregional Conservation Plan	Target Species	The Nature Conservancy Barbour et al. (2003)		X	X	X	X	X	X	X
Marine Resources Management Plan		CT DEP, Marine Fisheries Division	X	X	X	X	X	X	X	X
North Atlantic Coast Ecoregional Conservation Plan	Target species	The Nature Conservancy Beers and Davison (1999)		X	X	X	X	X	X	X
Recommendations for a New Ocean Policy		New Oceans Commission		X		X	X	X	X	
Species Accounts and Management Recommendations for Northeast Species of Conservation Concern	106 species of conservation concern	Northeastern Association of Fish and Wildlife Agencies		X	X	X	X	X	X	
Species Management Plans for Northeast Species of Conservation Concern (IN PROGRESS)		Northeast Fish and Wildlife Agency Administrators (in press)	X	X	X	X	X	X	X	X
State Comprehensive Outdoor and Recreation Plan		Bureau of Outdoor Recreation, CT DEP		X		X	X	X		
State Forest Management Plans		CT DEP, Forestry		X	X	X	X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Title	Species or Faunal Group	Source or Reference	Life History	Abundance and Status	Distribution	Threats and Problems	Conservation Actions	Monitoring	Research Needs	Adaptive Management
		Division,								
TNC Preserve Plans and Blueprint		TNC	X	X	X	X	X	X	X	X
Vision 2010: A Ten Year Plan	endangered species and their habitats	Quinebaug-Shetucket Heritage Corridor, Inc. (2000)	X	X	X	X	X	X	X	
Wetlands Management Program		CT DEP, Bureau of Water Management,		X	X	X	X	X	X	
Wildlife Habitat Incentive Plan		Natural Resources Conservation Service, USDA			X	X	X	X	X	

Appendix 2a: Connecticut's Vegetative Communities and Corresponding CWCS Habitats

This appendix outlines the full spectrum of habitats in Connecticut as excerpted from Metzler and Barrett's (in press), "Vegetation Classification for Connecticut". The corresponding CWCS habitats of greatest conservation need are indicated parenthetically in bold font. The key to CWCS habitats can be found in Table 2.1, page 2-18.

Terrestrial System - non-forested communities

Rocky Summits/Outcrops - dry to xeric exposed summits, ledges, and other outcrops with a vegetation of low shrubs, grasses, and herbs.

Acidic Rocky Summits/Outcrops (gneiss, schist, granite)

(3b) Upland Herbaceous: Grassy Glades and Balds

Schizachyrium scoparium - *Danthonia spicata* medium-tall grasslands

Schizachyrium scoparium / *Prunus pumila* var. *cuneata* community

Arctostaphylos uva-ursi - *Vaccinium angustifolium* dwarf shrublands

Subacidic Rocky Summits/Outcrops (basalt, diabase, calcareous schists)

(2a) Upland Woodland and Shrubs: Red Cedar Glades

(3b) Upland Herbaceous: Grassy Glades and Balds

Juniperus virginiana woodlands

Juniperus virginiana / *Danthonia spicata* community

Circumneutral Rocky Summits/Outcrops (marble, dolerite)

(2a) Upland Woodland and Shrubs: Red Cedar Glades

(3b) Upland Herbaceous: Grassy Glades and Balds

Juniperus virginiana woodlands

Juniperus virginiana / *Ostrya virginiana* community *Schizachyrium scoparium* -

Bouteloua curtipendula medium-tall grasslands

Cliffs - dry to xeric exposed and shaded cliffs and cliff faces with sparse vegetation in cracks, crevices and other fissures.

Sparsely Vegetated Rocks

Acidic Cliffs

Sub-acidic Cliffs

Circumneutral Cliffs

Talus - dry coarse-textured colluvial deposits of rock and boulders below cliffs and ledges with an open vegetation of vines, scattered herbs, and lichens.

Campanula rotundifolia - *Lechea tenuifolia* sparsely vegetated talus

Acidic Talus

Sub-acidic Talus

Circumneutral Talus

Sand Barrens - dry glaciofluvial deposits with a shrubby or grassy vegetation maintained by fire.

(3c) Upland Herbaceous: Sandplain and other Warm Season Grasslands

(3d) Upland Herbaceous: Sparsely Vegetated Sand and Gravel

Quercus ilicifolia shrublands

Andropogon gerardii - *Sorghastrum nutans* tall grasslands

Schizachyrium scoparium - *Danthonia spicata* medium-tall grasslands

Schizachyrium scoparius - *Hypericum gentianoides* community

Coastal Sand Dunes - poorly developed depositional systems on Long Island Sound with adjacent low energy beaches.

(2c) Upland Woodland and Shrub: Coastal Shrublands and Heaths

(3a) Upland Herbaceous: Coastal Dunes

Myrica pensylvanica - *Prunus maritima* shrublands

Hudsonia tomentosa dwarf shrublands

Ammophila breviligulata medium-tall grasslands

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Panicum virgatum medium-tall grasslands

Coastal Headlands - dry seaside cliffs, bluffs, and other open headlands exposed to winds and salt spray.

(2c) Upland Woodland and Shrub: Coastal Shrublands and Heaths

Seaside Cliffs and Outcrops

Pinus rigida - *Quercus stellata* woodlands

Seaside Bluffs

Terrestrial System - forested communities

Talus Forest/Woodland - dry to moist open woodland or forests on coarse colluvial deposits with soil and humus in pockets between the rocks.

Acidic Talus Forest/Woodland

Quercus rubra / *Polypodium virginiana* woodland

Subacidic Talus Forest/Woodland

Betula lenta - *Fraxinus americana* / *Geranium robertianum* woodland

Subacidic Cold Talus Forest/Woodland

Betula lenta - *Fraxinus americana* / *Geranium robertianum* woodland

Circumneutral Talus Forest/Woodland

Acer saccharum - *Fraxinus American* / *Asarum canadense* forest

Maritime Forests - dry to moist coastal forests mostly showing the effects of salt spray with low stature, gnarled trees and numerous lianas.

Maritime Forests On Stabilized Dunes

(3a) Upland Herbaceous: Coastal Dunes

Quercus coccinea - *Sassafras albidum* woodland

Maritime Forests On Other Upland Areas

(2c) Upland Woodland and Shrub: Coastal Shrublands and Heaths

Quercus rubrum/*Cornus florida* forests

Fagus grandifolia - *Quercus alba* - *Quercus rubra* - *Liriodendron tulipifera*
community

Quercus coccinea - *Sassafras albidum* woodland

Pinus rigida - *Quercus stellata* woodlands

Dry Acidic Forests - poorly growing forests often dominated by oaks with various mixtures of pine, often with dwarf ericaceous shrubs.

Dry Oak Forests On Stratified Sand and Gravel

(1a) Upland Forest: Dry Oak Forests on Sand and Gravel

(6b) Herbaceous Inland Wetland: Freshwater Marshes

Quercus velutina - (*Quercus prinus*) forests

Quercus velutina / *Gaylussacia baccata* community

Quercus velutina / *Vaccinium pallidum* community

Pinus rigida woodlands

Pinus rigida / *Quercus ilicifolia* community

Pinus rigida / *Vaccinium angustifolium* community

Dry Pine Forests On Stratified Sand and Gravel

(1a) Upland Forest: Dry Oak Forests on Sand and Gravel

(6b) Herbaceous Inland Wetland: Freshwater Marshes

Pinus rigida woodlands

Pinus rigida / *Quercus ilicifolia* community

Pinus rigida / *Vaccinium angustifolium* community

On Glacial Till

Tsuga canadensis forests

(1c) Upland Forest: Coniferous Forests

Quercus velutina - (*Quercus prinus*) forests

Quercus velutina / *Gaylussacia baccata* community

Quercus velutina / *Vaccinium pallidum* community

Dry Subacidic Forests - slow growing forests often dominated by white ash, hickories, and hop hornbeam with few shrubs and an open grassy ground cover.

Acer saccharum - *Quercus* ssp. forests

Acer saccharum - *Fraxinus americana* / *Hepatica americana* community

Carya glabra - *Fraxinus americana* forests

Carya glabra - *Fraxinus americana* / *Viburnum rafinesquianum* community

Carya glabra - *Fraxinus americana* / *Carex pensylvanica* community

Juniperus virginiana woodlands

Juniperus virginiana / *Danthonia spicata* community

Dry Circumneutral Forests –

(1b) Upland Forest: Calcareous Forests

Acer saccharum - *Quercus* ssp. forests

Acer saccharum - *Quercus muehlenbergii* / *Carex eburnea* community

Juniperus virginiana woodlands

Juniperus virginiana / *Ostrya virginiana* community

Mesic Acidic Forests - well-developed forests often with a dense high shrub layer and scattered herbs.

On Stratified Sand and Gravel

Quercus rubrum/*Cornus florida* forests

Quercus rubra / *Viburnum acerifolium* community

Quercus rubra - *Betula alleghaniensis* forests

Quercus rubra - *Betula alleghaniensis* / *Osmunda cinnamomea* community

On Glaciolacustrine Silts and Clays

Quercus rubra - *Betula alleghaniensis* forests

Quercus rubra - *Betula alleghaniensis* / *Osmunda cinnamomea* community

On Glacial Till

Tsuga canadensis forests

(1c) Upland Forest: Coniferous Forests

Acer saccharum - *Fagus grandifolia* - *Betula alleghaniensis* forests

Acer saccharum - *Fagus grandifolia* / *Viburnum alnifolia* community

Acer saccharum - *Fagus grandifolia* / *Dryopteris intermedia* community

Quercus rubrum / *Cornus florida* forests

Quercus rubra / *Viburnum acerifolium* community

Fagus grandifolia - *Quercus alba* - *Quercus rubra* - *Liriodendron tulipifera* community

Quercus rubra - *Betula alleghaniensis* forests

Quercus rubra - *Betula alleghaniensis* / *Osmunda cinnamomea* community

Mesic Circumneutral Forests –

(1b) Upland Forest: Calcareous Forests

Cove Forests - moist forests at the base of slopes where colluvium accumulates; generally dominated by Sugar maple and White ash; nutrients provided by surface runoff.

Acer saccharum - *Fraxinus americana* - *Tilia americana* forests

Acer saccharum - *Fraxinus americana* / *Asarum canadensis* community

Acer saccharum - *Fraxinus americana* / *Dryopteris noveboresensis* community

Acer saccharum - *Liriodendron tulipifera* / *Cimicifuga racemosa* community

Seepage Forests - moist forests at the base of slopes with groundwater discharge; generally dominated by Sugar maple, White ash, and Tulip poplar.

Acidic Seepage Forests

Acer saccharum - *Fraxinus americana* - *Tilia americana* forests

Acer saccharum - *Fraxinus americana* / *Athyrium thelypteroides* community

Acer saccharum Fraxinus americana / Osmunda claytoniana community

Circumneutral Seepage Forests

(1b) Upland Forest: Calcareous Forests

Acer saccharum - Fraxinus americana - Tilia americana forests

Alluvial Forests - mesic forests influenced by seasonal inundation mostly with well-drained, nutrient rich soils.

Floodplain Forests

(4d) Forested Inland Wetland: Floodplain Forests

Acer saccharum- Carya cordiformis temporarily flooded forests

Acer saccharum - Fraxinus americana / Carex sprengalli community

Acer saccharinum - Populus deltoides temporarily flooded forests

Acer saccharinum / Boehmeria cylindrica community

Acer saccharinum / Onoclea sensibilis community

Acer saccharinum / Eupatorium rugosum community

Quercus palustris - Fraxinus pennsylvanica temporarily flooded forests

Platanus occidentalis - Acer negundo temporarily flooded forests

Stream Bottom Forests

(4d) Forested Inland Wetland: Floodplain Forests

Palustrine System - non-forested communities

Palustrine Aquatic Beds - floating or submerged aquatic beds; often rooted in shallow water.

Pond and Lake Shores - seasonally exposed sandy, gravelly, or muddy sediments.

Acidic Pond and Lake Shores

(9e) Freshwater Aquatic: Lakes and their Shorelines

(9f) Freshwater Aquatic: Coastal Plain Ponds

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Salix nigra temporarily flooded shrublands
 Salix nigra / *Panicum dichotomiflorum* community
Alnus rugosa temporarily flooded shrublands
 Alnus rugosa - *Salix* spp. community
Phalaris arundinacea temporarily flooded grasslands
Calamagrostis canadensis temporarily flooded grasslands
 Calamagrostis canadensis - *Viola lanceolata* community
Carex stricta temporarily flooded grasslands
Dulichium arundinacea semipermanently-flooded grasslands
 Lysimachia terrestris - *Dulichium arundinacea* community
Peltandra virginica - *Saururus cernuus* - *Carex crinita* / *Climacium americana* semipermanently flooded forb vegetation
Pontederia cordata - *Peltandra virginica* semipermanently flooded forb vegetation
Rhexia virginica intermittently exposed forb vegetation
 Rhexia virginica - *Gratiola aurea* community
 Rhexia virginica - *Rhynchospora* spp. - *Panicum* spp. community
Eriocaulon aquaticum - *Lobelia dortmanna* intermittently exposed forb vegetation

Circumneutral Pond and Lake Shores

(9f) Freshwater Aquatic: Coastal Plain Ponds

Carex stricta temporarily flooded grasslands
Carex lacustris - *Typha* spp. temporarily flooded grasslands

Riverbank Communities - flood scoured rocky or gravelly riverbanks with annual or perennial vegetation.

Riverbank Beach/Shore Community

(9a) Freshwater Aquatic: Large Rivers and their Associated Riparian Zones

Salix nigra temporarily flooded shrublands
 Salix nigra / *Panicum dichotomiflorum* community
Alnus rugosa temporarily flooded shrublands
 Alnus rugosa - *Salix* spp. community
Andropogon gerardii temporarily flooded grasslands

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Andropogon gerardii - *Campanula rotundifolia* - *Solidago simplex* community
Carex torta temporarily flooded grasslands

Riverside Seep

(6a) Herbaceous Inland Wetland: Calcareous Spring Fens

(9a) Freshwater Aquatic: Large Rivers and their Associated Riparian Zones

Carex interior - *Carex leptalea* - *Carex flava* saturated grasslands

Carex sterilis / *Potentilla fruticosa* community

Carex sterilis / *Cornus racemosa* community

Riverside Outcrop

(9a) Freshwater Aquatic: Large Rivers and their Associated Riparian Zones

Alluvial Marsh - open wetlands periodically inundated by adjacent rivers or streams, influenced by run-off from adjacent upland; peat accumulation minimal.

(6b) Herbaceous Inland Wetland: Freshwater Marshes

Typha latifolia semipermanently-flooded grasslands

Basin Marsh - open wetlands found in glacial kettles or other topographically defined basins.

(6b) Herbaceous Inland Wetland: Freshwater Marshes

Vaccinium corymbosum seasonally flooded shrublands

Vaccinium corymbosum - *Rhododendron viscosum* community

Cephalanthus occidentalis semipermanently flooded shrublands

Cephalanthus occidentalis / *Glyceria canadensis* community

Decodon verticillatus semipermanently flooded shrublands

Spring Fens - naturally open wetlands occupying groundwater discharge sites; peat accumulation is minimal.

(6a) Herbaceous Inland Wetland: Calcareous Spring Fens

Acidic Spring Fen

Chrysosplenium americanum saturated forb vegetation

Circumneutral Spring Fen

Carex interior - *Carex leptalea* - *Carex flava* saturated grasslands

Carex sterilis / *Potentilla fruticosa* community

Carex sterilis / *Cornus racemosa* community

Topogenic Peatlands - natural peatlands occupying topographically defined basins; influenced by ground water; on deep poorly-decomposed peats.

(5a) Shrub Inland Wetland: Bogs, Seeps and Fens

Rich Fen - peatlands influenced by base-rich waters

Potentilla fruticosa seasonally flooded shrublands

Potentilla fruticosa - *Betula pumila* / *Carex lacustris* community

Potentilla fruticosa - *Salix candida* - *Cornus amomum* / *Carex stricta* community

Potentilla fruticosa - *Myrica gale* / *Carex lasiocarpa* - *Cladium mariscoides* community

Carex lasiocarpa saturated grasslands

Carex lasiocarpa / *Chamaedaphne calyculata* community

Medium Fen - peatlands dominated by ericaceous shrubs and sedges.

Chamaedaphne calyculata saturated dwarf shrublands

Chamaedaphne calyculata / *Carex utriculata* var. *rostrata* community

Carex lasiocarpa saturated grasslands

Carex lasiocarpa - *Carex aquatilis* community

Cladium mariscoides saturated grasslands

Cladium mariscoides - *Rhynchospora alba* community

Cladium mariscoides - *Carex exilis* community

Cladium mariscoides - *Drosera intermedia* - *Eleocharis rostellata* community

Rhynchospora alba saturated grasslands

Rhynchospora alba / *Sphagnum cuspidatum* community

Poor Fen - peatlands dominated by ericaceous shrubs.

Vaccinium corymbosum seasonally flooded shrublands

Vaccinium corymbosum / *Osmunda cinnamomea* community

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Chamaedaphne calyculata saturated dwarf shrublands

Chamaedaphne calyculata - *Picea mariana* community

Chamaedaphne calyculata - *Rhynchospora alba* community

Chamaedaphne calyculata / *Triadenum virginicum* community

Gaylussacia baccata saturated dwarf shrublands

Palustrine System - forested communities

Basin Swamp - forested and/or shrub swamps with stagnant or slow moving water; in topographically defined basins; on decomposed peats and mucks.

Acidic Red Maple-Ericaceous Basin Swamp

Acer rubrum / *Vaccinium corymbosum* seasonally flooded forests

Acer rubrum / *Ilex verticillata* - *Vaccinium corymbosum* community

Acer rubrum - *Quercus palustris* seasonally flooded forests

Acer rubrum seasonally flooded woodlands

Acer rubrum / *Carex stricta* community

Acidic Hemlock Basin Swamp

Tsuga canadensis seasonally flooded forests

Acidic Atlantic White Cedar Basin Swamp

(4a) Forested Inland Wetland: Atlantic White Cedar Swamps

Chamaecyperis thyoides seasonally flooded forests

Chamaecyperis thyoides / *Vaccinium corymbosum* community

Chamaecyperis thyoides / *Rhododendron maximum* community

Acidic Red/Black Spruce Basin Swamp

(4b) Forested Inland Wetland: Red/Black Spruce Swamps

Picea rubens saturated forests

Picea rubens / *Nemopanthus mucronata* community

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Picea mariana saturated forests

Picea mariana / *Kalmia angustifolia* community

Picea mariana saturated woodlands

Picea mariana / *Nemopanthus mucronata* community

Circumneutral Maple/Ash Basin Swamp

Acer rubrum / *Symplocarpus foetidus* seasonally flooded forests

Acer rubrum - *Fraxinus nigra* / *Ranunculus hispidus* var. *caricetorum* community

Acer rubrum / *Lindera benzoin* community

Circumneutral Northern White Cedar Basin Swamp

(4c) Forested Inland Wetland: Northern White Cedar Swamps

Thuja occidentalis seasonally flooded forests

Seepage Swamps - swamps with flowing surface and/or telluric water, on gently sloping to sloping sites; peat accumulation minimal.

Acidic Seepage Swamp

Acer rubrum / *Symplocarpus foetidus* seasonally flooded forests

Acer rubrum - *Fraxinus nigra* / *Ranunculus hispidus* var. *caricetorum* community

Acer rubrum / *Lindera benzoin* community

Acer rubrum / *Onoclea sensibilis* community

Circumneutral Seepage Swamp

Acer rubrum / *Symplocarpus foetidus* seasonally flooded forests

Acer rubrum - *Fraxinus nigra* / *Ranunculus hispidus* var. *caricetorum* community

Acer rubrum / *Lindera benzoin* community

Acer rubrum / *Onoclea sensibilis* community

Acer rubrum seasonally flooded woodlands

Acer rubrum / *Carex lacustris* community

Alluvial Swamp - swamps influenced by periodic flooding from adjacent rivers or streams; often influenced by run-off from the adjoining upland.

(4d) Forested Inland Wetland: Floodplain Forests

Acer saccharinum - *Populus deltoides* temporarily flooded forests
Acer saccharinum / *Boehmeria cylindrica* community
Acer saccharinum / *Onoclea sensibilis* community
Acer saccharinum / *Eupatorium rugosum* community

Estuarine System

Intertidal Flats - irregularly and regularly exposed mud or sand with sparse or dense vegetation.

Saltwater Intertidal Flats (polysaline 18-30 ppt)

Brackish Intertidal Flats (mesosaline 0.5-18 ppt)

Fresh Intertidal Flats (fresh <0.5 ppt)

Sagittaria subulata tidally-flooded forb vegetation
Sagittaria subulata - *Zannichellia palustris* community
Eriocaulon parkeri tidally-flooded forb vegetation
Eriocaulon parkeri - *Polygonum punctatum* community
Eriocaulon parkeri - *Hypericum mutilum* - *Gratiola aurea* community

Intertidal Beaches and Shores –

(8b) Tidal Wetland: Intertidal Beaches and Shores

Saltwater Intertidal Beaches and Shores

Cakile edentula tidally-flooded forb vegetation
Cakile edulenta - *Chenopodium album* community

Brackish Intertidal Beaches and Shores

Scirpus pungens tidally-flooded grasslands
Scirpus pungens - *Sagittaria* spp. community

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Amaranthus cannabinus tidally-flooded forb vegetation

Fresh Intertidal Beaches and Shores

Scirpus pungens tidally-flooded grasslands

Scirpus pungens - *Sagittaria* spp. community

Intertidal Marshes - regularly and irregularly flooded marshes.

(8a) Tidal Wetland: Tidal Wetlands

Salt Marsh

Iva frutescens tidally-flooded shrublands

Iva frutescens / *Panicum virgatum* community

Spartina alterniflora tidally-flooded grasslands

Spartina alterniflora community

Spartina patens tidally-flooded grasslands

Spartina patens - *Distichlis spicata* community

Spartina patens - *Agrostis stolonifera* community

Salicornia europaea tidally-flooded forb vegetation

Salicornia europaea - *Spartina alterniflora* community

Brackish Marsh

Spartina alterniflora tidally-flooded grasslands

Spartina alterniflora - *Lilaeopsis chinensis* community

Scirpus pungens tidally-flooded grasslands

Scirpus pungens - *Scirpus robustus* community

Typha angustifolia tidally-flooded grasslands

Typha angustifolia - *Hibiscus moscheutos* community

Spartina patens tidally-flooded grasslands

Spartina patens - *Distichlis spicata* community

Spartina patens - *Agrostis stolonifera* community

Freshwater Tidal Marsh

Alnus rugosa - *Cornus amomum* - *Ilex verticillata* tidally-flooded shrublands

Zizania aquatica tidally-flooded grasslands

Zizania aquatica - *Pontederia cordata* community

Acorus calamus tidally-flooded grasslands

Scirpus fluviatilis tidally-flooded grasslands

Carex lacustris tidally-flooded grasslands

Carex lacustris - *Calamagrostis canadensis* - *Elymus canadensis* community

Peltandra virginica tidally-flooded forb vegetation

Peltandra virginica - *Cyperus strigosus* community

Onoclea sensibilis tidally-flooded forb vegetation

Onoclea sensibilis - *Scirpus fluviatilis* - *Typha* spp. community.

Intertidal Swamps - regularly flooded swamps dominated by woody shrubs and scattered trees.

(8a) Tidal Wetland: Tidal Wetlands

Fresh Intertidal Swamps

Acer rubrum - *Fraxinus pennsylvanica* tidally-flooded woodlands

Acer rubrum - *Fraxinus pennsylvanica* community

Intertidal Aquatic Beds - aquatic beds generally intermixed with rocky shores.

Saltwater Intertidal Aquatic Beds

Brackish Intertidal Aquatic Beds

Freshwater Intertidal Aquatic Beds

Subtidal Aquatic Beds - submerged aquatic beds growing on various substrates.

(10b) Estuarine Aquatic: Vegetation Beds

Saltwater Subtidal Aquatic Beds

Brackish Subtidal Aquatic Beds

Freshwater Subtidal Aquatic Beds

Appendix 2b: Crosswalk of Connecticut's Habitats

This appendix links Connecticut's Key Habitats to the National Land Cover Class Definitions (NLCD) described in the National Land Cover Characterization (USGS 2001; <http://landcover.usgs.gov/natl/landcover.html>) and to the National Vegetation Classification System (NVC) described in NatureServe Explorer: An Online Encyclopedia of Life (2005; <http://www.natureserve.org/explorer>). IAFWA guidance recommended that linkage be made between states' key habitats and regional and national classification systems. This appendix addresses Element 2.

Note that the numerals and letters in the first column (CT's CWCS Key Habitats) corresponds to the written descriptions of Key Habitats in Chapter 2 (which is repeated at the end of this appendix). Information in Columns 2-5 is from The Vegetation of Connecticut (Metzler and Barrett, in press). In the last column (NVC), "NA" notes where there is no NVC correlate to Metzler and Barrett.

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
3B	Rocky Summit/Outcrops	Acidic Rocky Summit/Outcrops (gneiss, schist, granite)	Little bluestem – Poverty oatgrass (<i>Schizachyrium scoparium</i> - <i>Danthonia spicata</i>) medium-tall grasslands	Little bluestem / Sesquehana sandcherry (<i>Schizachyrium scoparius</i> / <i>Prunus pumila</i> var. <i>susquehanae</i>) community	71	6121
11A	Rocky Summit/Outcrops	Acidic Rocky Summit/Outcrops	Kinnikinnuck – Lowbush blueberry (<i>Arctostaphylos uva-ursi</i> - <i>Vaccinium angustifolium</i>) dwarf-shrublands		52	5094
2B	Rocky Summit/Outcrops	Acidic Rocky Summit/Outcrops	<i>Pinus rigida</i> woodlands	Pitch pine / Bear oak (<i>Pinus rigida</i> - <i>Quercus ilicifolia</i>) community	42	6116 6025
3	Rocky Summit/Outcrops	Acidic Rocky Summit/Outcrops	Mountain spleenwort (<i>Asplenium montanum</i>) sparsely vegetated cliffs		71	NA
11A	Rocky	Subacidic Rocky	Eastern redcedar	Eastern redcedar / Poverty	42	6002

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
	Summit/Outcrops	Summits/Outcrops (basalt, diabase, calcareous schists)	(<i>Juniperus virginiana</i>) woodlands	oatgrass (<i>Juniperus virginiana</i> / <i>Danthonia spicata</i>) community		
2A	Rocky Summit/Outcrops	Circumneutral Rocky Summits/Outcrops (marble, dolerite)	Eastern redcedar (<i>Juniperus virginiana</i>) woodlands	Eastern redcedar / Hophornbeam (<i>Juniperus virginiana</i> / <i>Ostrya virginiana</i>) community	43	6180
3B	Rocky Summit/Outcrops	Circumneutral Rocky Summits/Outcrops (marble, dolerite)	Little bluestem – Sideoats grama (<i>Schizachyrium scoparium</i> - <i>Bouteloua curtipendula</i>) medium-tall grasslands		71	6047
1B	Rocky Summit/Outcrops	Circumneutral Rocky Summits/Outcrops (marble, dolerite)	Wallrue spleenwort – Purple cliffbrake (<i>Asplenium ruta-muraria</i> – <i>Pellaea atropurpurea</i>) sparsely vegetated cliffs		71	NA
3	Talus		Bluebell bellflower – Narrowleaf pinweed (<i>Campanula rotundifolia</i> - <i>Lechea tenuifolia</i>) sparsely vegetated talus		71	NA
2B	Sand Barrens		Bear oak (<i>Quercus ilicifolia</i>) shrublands		52	6121
3C	Sand Barrens		Big bluestem – Indiangrass (<i>Andropogon gerardii</i> - <i>Sorghastrum nutans</i>) tall grasslands		71	6518

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
3C	Sand Barrens		Little bluestem – Poverty oatgrass (<i>Schizachyrium scoparium</i> - <i>Danthonia spicata</i>) medium-tall grasslands	Little bluestem – Orangegrass (<i>Schizachyrium scoparium</i> - <i>Hypericum gentianoides</i>) community	71	6544
3A	Coastal Sand Dunes		Northern bayberry – Beach plum (<i>Morella pensylvanica</i> - <i>Prunus maritima</i>) shrublands		52	6295
3A	Coastal Sand Dunes		False beachheather (<i>Hudsonia tomentosa</i>) dwarf-shrublands		52	6143
3A	Coastal Sand Dunes		American beachgrass (<i>Ammophila breviligulata</i>) medium-tall grasslands		71	6274
3A	Coastal Sand Dunes		Seaside threeawn – Field sagewort (<i>Aristida tuberculosa</i> - <i>Artemisia campestris ssp. caudata</i>) low forb vegetation		71	6161
11C	Coastal Headlands		Pitch pine – Post oak (<i>Pinus rigida</i> - <i>Quercus stellata</i>) woodlands		43	6373
1	Talus Forest/Woodlands	Acidic Talus Forest/Woodlands	Northern red oak – Rock polypody (<i>Quercus rubra</i> / <i>Polypodium virginiana</i>) woodlands		41	6320
1	Talus Forest/Woodlands	Acidic Talus Forest/Woodlands	Sugar maple – American basswood / Mountain		41	NA

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
			maple (<i>Acer saccharum</i> – <i>Tilia americana</i> - <i>Acer spicatum</i>) woodlands			
11A	Talus Forest/Woodlands	Subacidic Talus Forest/Woodlands	Yellow birch – White ash / Robert geranium (<i>Betula lenta</i> - <i>Fraxinus americana</i> / <i>Geranium robertianum</i>) woodlands		41	5058
2C	Maritime Forests	Maritime Forests on Stabilized Dunes	Scarlet oak – Sassafras (<i>Quercus coccinea</i> - <i>Sassafras albidum</i>) woodlands		41	6145 6379
2C	Maritime Forests	Maritime Forests on Other Upland Areas	Northern red oak / Flowering dogwood (<i>Quercus rubra</i> / <i>Cornus florida</i>) forests	American beech – White oak – Northern red oak – Tulip tree (<i>Fagus grandifolia</i> - <i>Quercus alba</i> - <i>Quercus rubra</i> - <i>Liriodendron tulipifera</i>) community	41	6125
2C	Maritime Forests	Maritime Forests on Other Upland Areas	Scarlet oak – Sassafras (<i>Quercus coccinea</i> - <i>Sassafras albidum</i>) woodlands		41	6145 6379
11C	Maritime Forests	Maritime Forests on Other Upland Areas	Pitch pine – Post oak (<i>Pinus rigida</i> - <i>Quercus stellata</i>) woodlands		43	6373 6212

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1A	Dry Acidic Forests	Dry Oak Forests on Stratified Sand and Gravel	Northern red oak - Black oak – Chestnut oak (<i>Quercus rubra</i> - <i>Quercus velutina</i> - <i>Quercus prinus</i>) forests	Black oak – Chestnut oak / Black huckleberry (<i>Quercus velutina</i> <i>Quercus prinus</i> / <i>Gaylussacia baccata</i>) community	41	6282 6290 6334 6134
1A	Dry Acidic Forests	Dry Oak Forests on Stratified Sand and Gravel	Northern red oak - Black oak – Chestnut oak (<i>Quercus rubra</i> - <i>Quercus velutina</i> - <i>Quercus prinus</i>) forests	Black oak / Blue Ridge blueberry (<i>Quercus velutina</i> / <i>Vaccinium pallidum</i>) community	41	6375
2B	Dry Acidic Forests	Dry Oak Forests on Stratified Sand and Gravel	Pitch pine (<i>Pinus rigida</i>) woodlands	Pitch pine / Bear oak (<i>Pinus rigida</i> / <i>Quercus ilicifolia</i>) community	42	6116 6025
2B	Dry Acidic Forests	Dry Oak Forests on Stratified Sand and Gravel	Pitch pine (<i>Pinus rigida</i>) woodlands	Pitch pine / Lowbush blueberry (<i>Pinus rigida</i> / <i>Vaccinium angustifolium</i>) community	42	5046 6290
2B	Dry Acidic Forests	Dry Pine Forests on Stratified Sand and Gravel	Pitch pine (<i>Pinus rigida</i>) woodlands	Pitch pine / Bear oak (<i>Pinus rigida</i> / <i>Quercus ilicifolia</i>) community	43	6116 6025
2B	Dry Acidic Forests	Dry Pine Forests on Stratified Sand and Gravel	Pitch pine (<i>Pinus rigida</i>) woodlands	Pitch pine / Lowbush blueberry (<i>Pinus rigida</i> / <i>Vaccinium angustifolium</i>) community	42	5046 6290
1C	Dry Acidic Forests	On Glacial Till	Eastern hemlock (<i>Tsuga canadensis</i>) forests		42	6328 6088

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1A	Dry Acidic Forests	On Glacial Till	Northern red oak - Black oak - Chestnut oak (<i>Quercus rubra</i> - <i>Quercus velutina</i> - <i>Quercus prinus</i>) forests	Black oak - Chestnut oak / Black huckleberry (<i>Quercus velutina</i> - <i>Quercus prinus</i> / <i>Gaylussacia baccata</i>) community	41	6282 6290 6334 6134
1A	Dry Acidic Forests	On Glacial Till	Northern red oak - Black oak - Chestnut oak (<i>Quercus rubra</i> - <i>Quercus velutina</i> - <i>Quercus prinus</i>) forests	Black oak / Blue Ridge blueberry (<i>Quercus velutina</i> / <i>Vaccinium pallidum</i>) community	41	6375
1	Dry Subacidic Forests		Sugar maple - Oak ssp. (<i>Acer saccharum</i> - <i>Quercus ssp.</i>) forests	Sugar maple - White ash / Roundlobe hepatica (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Hepatica nobilis var. obtusa</i>) community	41	6040
1	Dry Subacidic Forests		Pignut hickory - White ash (<i>Carya glabra</i> - <i>Fraxinus americana</i>) forests		41	6301
2A	Dry Subacidic Forests		Eastern red cedar (<i>Juniperus virginiana</i>) woodlands	Eastern red cedar / Poverty oatgrass (<i>Juniperus virginiana</i> / <i>Danthonia spicata</i>) community	42	6002

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1B	Dry Circumneutral Forests		Sugar maple – Oak spp. (<i>Acer saccharum</i> - <i>Quercus</i> spp.) forests	Sugar maple – Chinkapin oak / Bristleleaf sedge (<i>Acer saccharum</i> - <i>Quercus muehlenbergii</i> / <i>Carex eburnea</i>) community	41	6162
2A	Dry Circumneutral Forests		Eastern red cedar (<i>Juniperus virginiana</i>) woodlands	Eastern red cedar / Hophornbeam (<i>Juniperus virginiana</i> / <i>Ostrya virginiana</i>) community	43	6180
1	Mesic Acidic Forests	On Stratified Sand and Gravel	Northern red oak / Flowering dogwood (<i>Quercus rubra</i> / <i>Cornus florida</i>) forests	Northern red oak / Mapleleaf viburnum (<i>Quercus rubra</i> / <i>Viburnum acerifolium</i>) community	41	6336
1	Mesic Acidic Forests	On Stratified Sand and Gravel	Northern red oak – Yellow birch (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i>) forests	Northern red oak – Yellow birch / Cinnamon fern (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i> / <i>Osmunda cinnamomea</i>) community	41	6000
1	Mesic Acidic Forests	On Glaciolacustrine Silts and Clays	Northern red oak – Yellow birch (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i>) forests	Northern red oak – Yellow birch / Cinnamon fern (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i> / <i>Osmunda cinnamomea</i>) community	41	6000

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1C	Mesic Acidic Forests	On Glacial Till	Eastern hemlock (<i>Tsuga canadensis</i>) forests		42	6328 6109 6088
1	Mesic Acidic Forests	On Glacial Till	Sugar maple – American beech – Yellow birch (<i>Acer saccharum</i> - <i>Fagus grandifolia</i> - <i>Betula alleghaniensis</i>) forests	Sugar maple – American beech / Hobblebush (<i>Acer saccharum</i> - <i>Fagus grandifolia</i> / <i>Viburnum alnifolia</i>) community	41	6252 6008 6109
1	Mesic Acidic Forests	On Glacial Till	Sugar maple – American beech – Yellow birch (<i>Acer saccharum</i> - <i>Fagus grandifolia</i> - <i>Betula alleghaniensis</i>) forests	Sugar maple – American beech / Intermediate wood fern (<i>Acer saccharum</i> - <i>Fagus grandifolia</i> / <i>Dryopteris intermedia</i>) community	41	6252
1	Mesic Acidic Forests	On Glacial Till	Northern red oak / Flowering dogwood (<i>Quercus rubra</i> / <i>Cornus florida</i>) forests	Northern red oak / Mapleleaf viburnum (<i>Quercus rubra</i> / <i>Viburnum acerifolium</i>) community	41	6336
1	Mesic Acidic Forests	On Glacial Till	Northern red oak / Flowering dogwood (<i>Quercus rubra</i> / <i>Cornus florida</i>) forests	American beech – White oak – Northern red oak – Tulip tree (<i>Fagus grandifolia</i> - <i>Quercus alba</i> - <i>Quercus rubra</i> - <i>Liriodendron tulipifera</i>) community	41	6336

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1	Mesic Acidic Forests	On Glacial Till	Northern red oak – Yellow birch (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i>) forests	Northern red oak – Yellow birch / Cinnamon fern (<i>Quercus rubra</i> - <i>Betula alleghaniensis</i> / <i>Osmunda cinnamomea</i>) community	41	6000
1	Cove Forests		Sugar maple – White ash – American basswood (<i>Acer saccharum</i> - <i>Fraxinus americana</i> - <i>Tilia americana</i>) forests	Sugar maple – White ash / Blue cohosh (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Caulophyllum thalictroides</i>) community	41	5008
1	Cove Forests		Sugar maple – White ash – American basswood (<i>Acer saccharum</i> - <i>Fraxinus americana</i> - <i>Tilia americana</i>) forests	Sugar maple – White ash / Marsh fern (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Thelypteris noveboracensis</i>) community	41	6211
1	Seepage Forests	Acidic Seepage Forests	Sugar maple – White ash – American basswood (<i>Acer saccharum</i> - <i>Fraxinus americana</i> - <i>Tilia americana</i>) forests	Sugar maple – White ash / Silver false spleenwort (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Deparia acrostichoides</i>) community	41	5000

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
1	Seepage Forests	Circumneutral Seepage Forests	Sugar maple – White ash – American basswood (<i>Acer saccharum</i> - <i>Fraxinus americana</i> - <i>Tilia americana</i>) forests	Sugar maple – White ash / Blue cohosh (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Caulophyllum thalictroides</i>) community	41	5008
1	Seepage Forests	Circumneutral Seepage Forests	Sugar maple – White ash – American basswood (<i>Acer saccharum</i> - <i>Fraxinus americana</i> - <i>Tilia americana</i>) forests	Sugar maple – White ash / Marsh fern (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Thelypteris noveboracensis</i>) community	41	6211
4D	Alluvial Forests	Floodplain Forests	Sugar maple – Bitternut hickory (<i>Acer saccharum</i> - <i>Carya cordiformis</i>) temporarily flooded forests	Sugar maple – White ash / Sprengel's sedge (<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Carex sprengealii</i>) community	90	6114
4D	Alluvial Forests	Floodplain Forests	Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / Smallspike false nettle (<i>Acer saccharinum</i> / <i>Boehmeria cylindrica</i>) community	90	6176
4D	Alluvial Forests	Floodplain Forests	Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / Sensitive fern (<i>Acer saccharinum</i> / <i>Onoclea sensibilis</i>) community	90	6001

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
4D	Alluvial Forests	Floodplain Forests	Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / White snakeroot (<i>Acer saccharinum</i> / <i>Ageratina altissima</i>) community	90	6147
4D	Alluvial Forests	Floodplain Forests	Pin oak – Green ash (<i>Quercus palustris</i> - <i>Fraxinus pennsylvanica</i>) temporarily flooded forests		90	6185
4D	Alluvial Forests	Floodplain Forests	American sycamore – Boxelder (<i>Platanus occidentalis</i> - <i>Acer negundo</i>) temporarily flooded forests		90	6036
9B	Palustrine Aquatic Beds		Riverweed (<i>Podostemum ceratophyllum</i>) permanently flooded vegetation		95	4331
9	Palustrine Aquatic Beds		Varigated yellow pond-lily (<i>Nuphar lutea</i> ssp. <i>variegata</i>) permanently flooded vegetation	Varigated yellow pond-lily – American white waterlily (<i>Nuphar lutea</i> ssp. <i>variegata</i> – <i>Nymphaea odorata</i>) community	95	4324
9	Palustrine Aquatic Beds		Coon's tail – Canadian waterweed (<i>Ceratophyllum demersum</i> – <i>Elodea canadensis</i>) permanently flooded		95	NA

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
			vegetation			
9	Palustrine Aquatic Beds		Tapegrass (<i>Vallisneria americana</i>) permanently flooded vegetation	Tapegrass (<i>Vallisneria americana</i>) community	95	6196
5	Pond and Lake Shores	Acidic Pond and Lake Shores	Black willow (<i>Salix nigra</i>) temporarily flooded shrublands	Black willow / Fall panicgrass (<i>Salix nigra</i> / <i>Panicum dichotomiflorum</i>) community	90	NA
5	Pond and Lake Shores	Acidic Pond and Lake Shores	Speckled alder (<i>Alnus incana ssp. rugosa</i>) temporarily flooded shrublands	Speckled alder – Willow (<i>Alnus incana ssp. rugosa</i> - <i>Salix spp.</i>) community	90	5082 6062
9	Pond and Lake Shores	Acidic Pond and Lake Shores	Reed canarygrass (<i>Phalaris arundinacea</i>) temporarily flooded grasslands		95	5174 6004
9	Pond and Lake Shores	Acidic Pond and Lake Shores	Bluejoint (<i>Calamagrostis canadensis</i>) temporarily flooded grasslands	Bluejoint – Bog white violet (<i>Calamagrostis canadensis</i> - <i>Viola lanceolata</i>) community	95	6243
9	Pond and Lake Shores	Acidic Pond and Lake Shores	Tussock sedge (<i>Carex stricta</i>) temporarily flooded grasslands		95	6412
5A	Pond and Lake Shores	Acidic Pond and Lake Shores	Threeway sedge (<i>Dulichium arundinacea</i>) semipermanently-flooded grasslands	Threeway sedge – Swamp candles (<i>Dulichium arundinacea</i> - <i>Lysimachia terrestris</i>) community	95	6035

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
9A	Pond and Lake Shores	Acidic Pond and Lake Shores	Green arrow arum – Lizard’s tail (<i>Peltandra virginica</i> - <i>Saururus cernuus</i>) semipermanently flooded forb vegetation		95	7696
9	Pond and Lake Shores	Acidic Pond and Lake Shores	Pickerelweed – Green arrow arum (<i>Pontederia cordata</i> - <i>Peltandra virginica</i>) semipermanently flooded forb vegetation		95	6191
9F	Pond and Lake Shores	Acidic Pond and Lake Shores	Common meadowbeauty (<i>Rhexia virginica</i>) intermittently exposed forb vegetation	Common meadowbeauty – Golden hedgehyssop (<i>Rhexia virginica</i> - <i>Gratiola aurea</i>) community	95	6300
9F	Pond and Lake Shores	Acidic Pond and Lake Shores	Common meadowbeauty (<i>Rhexia virginica</i>) intermittently exposed forb vegetation	Common meadowbeauty - Panicgrass (<i>Rhexia virginica</i> - <i>Panicum spp.</i>) community	95	6264
9F	Pond and Lake Shores	Acidic Pond and Lake Shores	Sevenangle pipewort – Dortmann’s cardinalflower (<i>Eriocaulon aquaticum</i> - <i>Lobelia dortmanna</i>) intermittently exposed forb vegetation		95	6346

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
9	Pond and Lake Shores	Circumneutral Pond and Lake Shores	Tussock sedge (<i>Carex stricta</i>) temporarily flooded grasslands		95	6412
8A	Pond and Lake Shores	Circumneutral Pond and Lake Shores	Hairy sedge – Cattail (<i>Carex lacustris</i> - <i>Typha spp.</i>) temporarily flooded grasslands		95	6360
5	Riverbank Communities	Riverbank Beach/Shore Community	Black willow (<i>Salix nigra</i>) temporarily flooded shrublands	Black willow / Fall panicgrass (<i>Salix nigra</i> / <i>Panicum dichotomiflorum</i>) community	90	NA
5	Riverbank Communities	Riverbank Beach/Shore Community	Speckled alder (<i>Alnus incana ssp. rugosa</i>) temporarily flooded shrublands	Speckled alder – Willow (<i>Alnus incana ssp. rugosa</i> - <i>Salix spp.</i>) <u>community</u>	90	5082 6062
9A	Riverbank Communities	Riverbank Beach/Shore Community	Big bluestem (<i>Andropogon gerardii</i>) temporarily flooded grasslands	Big bluestem – Bluebell bellflower (<i>Andropogon gerardii</i> - <i>Campanula rotundifolia</i>) community	95	6284
9A	Riverbank Communities	Riverbank Beach/Shore Community	Twisted sedge (<i>Carex torta</i>) temporarily flooded grasslands		95	6536
6A	Riverbank Communities	Riverside Seep	Inland sedge – Bristlystalked sedge - Yellow sedge (<i>Carex interior</i> - <i>Carex leptalea</i> - <i>Carex flava</i>) saturated grasslands	Dioecious sedge / Shrubby cinquefoil (<i>Carex sterilis</i> / <i>Dasiphora floribunda</i>) community	95	6326

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
6A	Riverbank Communities	Riverside Seep	Inland sedge – Bristlystalked sedge - Yellow sedge (<i>Carex interior</i> - <i>Carex leptalea</i> - <i>Carex flava</i>) saturated grasslands	Dioecious sedge / Gray dogwood (<i>Carex sterilis</i> / <i>Cornus racemosa</i>) community	90	6123
6B	Alluvial Marsh		Narrowleaf cattail (<i>Typha latifolia</i>) semipermanently-flooded grasslands		95	6153
6B	Alluvial Marsh		Common reed (<i>Phragmites australis</i>) temporarily flooded grasslands		95	4187
6B	Basin Marsh		Swamp loosestrife (<i>Decodon verticillatus</i>) semipermanently flooded shrublands		95	5089
6	Spring Fens	Acidic Spring Fen	American golden saxifrage (<i>Chrysosplenium americanum</i>) saturated forb vegetation		95	6193
5A	Spring Fens	Circumneutral Spring Fen	Inland sedge – Bristlystalked sedge – Yellow sedge (<i>Carex interior</i> - <i>Carex leptalea</i> - <i>Carex flava</i>) saturated grasslands	Dioecious sedge / Shrubby cinquefoil (<i>Carex sterilis</i> / <i>Dasiphora floribunda</i>) community	95	6326

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
5A	Spring Fens	Circumneutral Spring Fen	Inland sedge – Bristlystalked sedge – Yellow sedge (<i>Carex interior</i> - <i>Carex leptalea</i> - <i>Carex flava</i>) saturated grasslands	Dioecious sedge / Gray dogwood (<i>Carex sterilis</i> / <i>Cornus racemosa</i>) community	90	6123
5A	Topogenic Peatlands	Rich Fen	Shrubby cinquefoil (<i>Dasiphora floribunda</i>) seasonally flooded shrublands	Shrubby cinquefoil – Bog birch / Hairy sedge (<i>Dasiphora floribunda</i> - <i>Betula pumila</i> / <i>Carex lacustris</i>) community	90	6360
5A	Topogenic Peatlands	Rich Fen	Shrubby cinquefoil (<i>Dasiphora floribunda</i>) seasonally flooded shrublands	Shrubby cinquefoil – Sageleaf willow – Silky dogwood / Tussock sedge (<i>Dasiphora floribunda</i> - <i>Salix candida</i> - <i>Cornus amomum</i> / <i>Carex stricta</i>) community	90	6359
5A	Topogenic Peatlands	Rich Fen	Shrubby cinquefoil (<i>Dasiphora floribunda</i>) seasonally flooded shrublands	Shrubby cinquefoil – Sweetgale / Woollyfruit sedge – Smooth sawgrass (<i>Dasiphora floribunda</i> - <i>Myrica gale</i> / <i>Carex lasiocarpa</i> - <i>Cladium mariscoides</i>) community	95	6068
6	Topogenic Peatlands	Rich Fen	Woollyfruit sedge (<i>Carex lasiocarpa</i>) saturated grasslands	Woollyfruit sedge / Leatherleaf (<i>Carex lasiocarpa</i> / <i>Chamaedaphne calyculata</i>)	95	6302

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
				community		
5A	Topogenic Peatlands	Medium Fen	Leatherleaf (<i>Chamaedaphne calyculata</i>) saturated dwarf-shrublands	Leatherleaf / Northwest Territory sedge (<i>Chamaedaphne calyculata</i> / <i>Carex utriculata</i> var. <i>rostrata</i>) community	90	6302
6	Topogenic Peatlands	Medium Fen	Woollyfruit sedge (<i>Carex lasiocarpa</i>) saturated grasslands	Woollyfruit sedge – Water sedge (<i>Carex lasiocarpa</i> - <i>Carex aquatilis</i>) community	95	6068
6	Topogenic Peatlands	Medium Fen	Twig-rush (<i>Cladium mariscoides</i>) saturated grasslands	Twig-rush - White beak sedge (<i>Cladium mariscoides</i> - <i>Rhynchospora alba</i>) community	95	NA
6	Topogenic Peatlands	Medium Fen	Twig-rush (<i>Cladium mariscoides</i>) saturated grasslands	Twig-rush – Meager sedge (<i>Cladium mariscoides</i> - <i>Carex exilis</i>) community	95	6392
6	Topogenic Peatlands	Medium Fen	Twig-rush (<i>Cladium mariscoides</i>) saturated grasslands	Twig-rush – Spoonleaf sundew – Beaked spikerush (<i>Cladium mariscoides</i> - <i>Drosera intermedia</i> - <i>Eleocharis rostellata</i>) community	95	6310

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
6	Topogenic Peatlands	Medium Fen	White beak sedge (<i>Rhynchospora alba</i>) saturated grasslands	White beak sedge / Sphagnum (<i>Rhynchospora alba</i> / <i>Sphagnum cuspidatum</i>) community	95	6394
6	Topogenic Peatlands	Medium Fen	Threeway sedge (<i>Dulichium aundinacea</i>) semipermanently-flooded grasslands	Threeway sedge / Sphagnum moss (<i>Dulichium arundinacea</i> / <i>Sphagnum spp.</i>) community	95	6131
5A	Topogenic Peatlands	Poor Fen	Highbush blueberry (<i>Vaccinium corymbosum</i>) seasonally flooded shrublands	Highbush blueberry / Swamp azalea (<i>Vaccinium corymbosum</i> / <i>Rhododendron viscosum</i>) community	90	6190 6371
5A	Topogenic Peatlands	Poor Fen	Leatherleaf (<i>Chamaedaphne calyculata</i>) saturated dwarf-shrublands	Leatherleaf – Black spruce (<i>Chamaedaphne calyculata</i> <i>Picea mariana</i>) community	90	6008 6098
5A	Topogenic Peatlands	Poor Fen	Leatherleaf (<i>Chamaedaphne calyculata</i>) saturated dwarf-shrublands	Leatherleaf – White beak sedge (<i>Chamaedaphne calyculata</i> <i>Rhynchospora alba</i>) community	90	6008

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
5A	Topogenic Peatlands	Poor Fen	Leatherleaf (<i>Chamaedaphne calyculata</i>) saturated dwarf-shrublands	Leatherleaf / Virginia marsh St. Johnswort (<i>Chamaedaphne calyculata</i> / <i>Triadenum virginicum</i>) community	90	6008
5A	Topogenic Peatlands	Poor Fen	Black huckleberry (<i>Gaylussacia baccata</i>) saturated dwarf-shrublands		90	6008
5A	Topogenic Peatlands	Poor Fen	Sweetgale (<i>Myrica gale</i>) saturated dwarf shrublands	Sweetgale – White meadowsweet – Leatherleaf (<i>Myrica gale</i> – <i>Spiraea alba</i> - <i>Chamaedaphne calyculata</i>) community	90	6512
4	Basin Swamp	Acidic Red Maple-Ericaceous Basin Swamp	Red maple / Highbush blueberry (<i>Acer rubrum</i> / <i>Vaccinium corymbosum</i>) seasonally flooded forests	Red maple / Common winterberry – Highbush blueberry (<i>Acer rubrum</i> / <i>Ilex verticillata</i> - <i>Vaccinium corymbosum</i>) community	90	6156 6014
4	Basin Swamp	Acidic Red Maple-Ericaceous Basin Swamp	Red maple – Pin oak (<i>Acer rubrum</i> - <i>Quercus palustris</i>) seasonally flooded forests		90	6240
4	Basin Swamp	Acidic Red Maple-Ericaceous Basin Swamp	Red maple (<i>Acer rubrum</i>) seasonally flooded woodlands	Red maple / Tussock sedge (<i>Acer rubrum</i> / <i>Carex stricta</i>) community	90	6119

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
4	Basin Swamp	Acidic Red Maple-Ericaceous Basin Swamp	Highbush blueberry (<i>Vaccinium corymbosum</i>) seasonally flooded shrublands	Highbush blueberry – Swamp azalea (<i>Vaccinium corymbosum</i> - <i>Rhododendron viscosum</i>) community	90	6190 6371
4	Basin Swamp	Acidic Eastern hemlock Basin Swamp	Eastern hemlock (<i>Tsuga canadensis</i>) seasonally flooded forests		90	6226 6380
4A	Basin Swamp	Acidic Atlantic White Cedar Basin Swamp	Atlantic white cedar (<i>Chamaecyperis thyoides</i>) seasonally flooded forests	Atlantic white cedar / Swamp azelea (<i>Chamaecyperis thyoides</i> / <i>Rhododendron viscosum</i>) community	90	6364
4A	Basin Swamp	Acidic Atlantic White Cedar Basin Swamp	Atlantic white cedar (<i>Chamaecyperis thyoides</i>) seasonally flooded forests	Atlantic white cedar – Red maple – Yellow birch (<i>Chamaecyperis thyoides</i> - <i>Acer rubrum</i> – <i>Betula alleghaniensis</i>) community	90	6189
4A	Basin Swamp	Acidic Atlantic White Cedar Basin Swamp	Atlantic white cedar (<i>Chamaecyperis thyoides</i>) seasonally flooded forests	Atlantic white cedar / Great laurel (<i>Chamaecyperis thyoides</i> / <i>Rhododendron maximum</i>) community	90	6355
4B	Basin Swamp	Acidic Red/Black Spruce Basin Swamp	Red spruce (<i>Picea rubens</i>) saturated forests	Red spruce / Common mountain holly (<i>Picea rubens</i> / <i>Nemopanthus mucronata</i>) community	90	6198

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
4B	Basin Swamp	Acidic Red/Black Spruce Basin Swamp	Black spruce (<i>Picea mariana</i>) saturated forests	Black spruce / Sheep laurel (<i>Picea mariana</i> / <i>Kalmia angustifolia</i>) community	90	6098
4B	Basin Swamp	Acidic Red/Black Spruce Basin Swamp	Black spruce (<i>Picea mariana</i>) saturated woodlands	Black spruce / Common mountain holly (<i>Picea mariana</i> / <i>Nemopanthus mucronata</i>) community	90	6198 6098 6194
4	Basin Swamp	Circumneutral Maple/Ash Basin Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple – Black ash / Bristly buttercup (<i>Acer rubrum</i> - <i>Fraxinus nigra</i> / <i>Ranunculus hispidus</i> var. <i>caricetorum</i>) community	90	6009
4	Basin Swamp	Circumneutral Maple/Ash Basin Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple / Northern spicebush (<i>Acer rubrum</i> / <i>Lindera benzoin</i>) community	90	6406
4C	Basin Swamp	Circumneutral Northern White Cedar Basin Swamp	Northern white cedar (<i>Thuja occidentalis</i>) seasonally flooded forests		90	6007
5	Basin Swamp	Circumneutral Northern White Cedar Basin Swamp	Common buttonbush (<i>Cephalanthus occidentalis</i>) semipermanently flooded shrublands	Common buttonbush / Rattlesnake mannagrass (<i>Cephalanthus occidentalis</i> / <i>Glyceria canadensis</i>) community	90	6069

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
4	Seepage Swamps	Acidic Seepage Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple – Black ash / Bristly buttercup (<i>Acer rubrum</i> - <i>Fraxinus nigra</i> / <i>Ranunculus hispidus</i> var. <i>caricetorum</i>) community	90	6009
4	Seepage Swamps	Acidic Seepage Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple / Northern spicebush (<i>Acer rubrum</i> / <i>Lindera benzoin</i>) community	90	6406
4	Seepage Swamps	Circumneutral Seepage Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple – Black ash / Bristly buttercup (<i>Acer rubrum</i> - <i>Fraxinus nigra</i> / <i>Ranunculus hispidus</i> var. <i>caricetorum</i>) community	90	6009
4	Seepage Swamps	Circumneutral Seepage Swamp	Red maple / Skunk cabbage (<i>Acer rubrum</i> / <i>Symplocarpus foetidus</i>) seasonally flooded forests	Red maple / Northern spicebush (<i>Acer rubrum</i> / <i>Lindera benzoin</i>) community	90	6406
4	Seepage Swamps	Circumneutral Seepage Swamp	Red maple (<i>Acer rubrum</i>) seasonally flooded woodlands	Red maple / Hairy sedge (<i>Acer rubrum</i> / <i>Carex lacustris</i>) community	90	6105

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
4D	Alluvial Swamp		Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / Smallspike false nettle (<i>Acer saccharinum</i> / <i>Boehmeria cylindrica</i>) community	90	6176
4D	Alluvial Swamp		Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / Sensitive fern (<i>Acer saccharinum</i> / <i>Onoclea sensibilis</i>) community	90	6001
4D	Alluvial Swamp		Silver maple – Eastern cottonwood (<i>Acer saccharinum</i> - <i>Populus deltoides</i>) temporarily flooded forests	Silver maple / White snakeroot (<i>Acer saccharinum</i> / <i>Ageratina altissima</i>) community	90	6147
10B	Estuarine Aquatic Beds		Tapegrass (<i>Vallisneria americana</i>) permanently flooded vegetation	Tapegrass (<i>Vallisneria americana</i>) community	95	6196
10B	Estuarine Aquatic Beds		Horned Pondweed (<i>Zannichellia palustris</i>) permanently flooded vegetation		95	6027
10B	Estuarine Aquatic Beds		Widgeongrass (<i>Ruppia maritima</i>) permanently flooded vegetation		95	6167
10B	Estuarine Aquatic Beds		Eelgrass (<i>Zostera marina</i>) permanently flooded vegetation		95	4336

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
8A	Intertidal Flats	Freshwater Intertidal Flats	Awl-leaf arrowhead (<i>Sagittaria subulata</i>) tidally-flooded forb vegetation	Awl-leaf arrowhead – Horned pondweed (<i>Sagittaria subulata</i> - <i>Zannichellia palustris</i>) community	95	4473
8A	Intertidal Flats	Freshwater Intertidal Flats	Parker's pipewort (<i>Eriocaulon parkeri</i>) tidally-flooded forb vegetation	Parker's pipewort – Dotted smartweed (<i>Eriocaulon parkeri</i> - <i>Polygonum punctatum</i>) community	95	6352
8A	Intertidal Flats	Freshwater Intertidal Flats	Parker's pipewort (<i>Eriocaulon parkeri</i>) tidally-flooded forb vegetation	Parker's pipewort – Dwarf St. Johnswort – Golden hedgehyssop (<i>Eriocaulon parkeri</i> - <i>Hypericum mutilum</i> <i>Gratiola aurea</i>) community	95	6352
8B	Intertidal Beaches and Shores	Saltwater Intertidal Beaches and Shores	American searocket (<i>Cakile edentula</i>) tidally-flooded forb vegetation	American searocket – Lambsquarters (<i>Cakile edentula</i> - <i>Chenopodium album</i>) community	95	4400
8B	Intertidal Beaches and Shores	Brackish Intertidal Beaches and Shores	Common threesquare (<i>Schoenoplectus pungens</i>) tidally-flooded grasslands	Common threesquare – Arrowhead (<i>Schoenoplectus pungens</i> - <i>Sagittaria spp.</i>) community	95	4188
8B	Intertidal Beaches and Shores	Brackish Intertidal Beaches and Shores	Tidemarsh amaranth (<i>Amaranthus cannabinus</i>) tidally-flooded forb vegetation		95	6080

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
8B	Intertidal Beaches and Shores	Freshwater Intertidal Beaches and Shores	Common threesquare (<i>Schoenoplectus pungens</i>) tidally-flooded grasslands	Common threesquare – Arrowhead (<i>Schoenoplectus pungens</i> - <i>Sagittaria spp.</i>) community	95	4188
8A	Intertidal Marshes	Salt Marsh	Northern marsh-elder (<i>Iva frutescens</i>) tidally-flooded shrublands	Northern marsh-elder / Switchgrass (<i>Iva frutescens</i> / <i>Panicum virgatum</i>) community	90	3921
8A	Intertidal Marshes	Salt Marsh	Switchgrass (<i>Panicum virgatum</i>) medium-tall grasslands		95	6150
8A	Intertidal Marshes	Salt Marsh	Smooth cordgrass (<i>Spartina alterniflora</i>) tidally-flooded grasslands	Smooth cordgrass (<i>Spartina alterniflora</i>) community	95	4192
8A	Intertidal Marshes	Salt Marsh	Saltmeadow cordgrass (<i>Spartina patens</i>) tidally-flooded grasslands	Saltmeadow cordgrass – Inland saltgrass (<i>Spartina patens</i> - <i>Distichlis spicata</i>) community	95	6006
8A	Intertidal Marshes	Salt Marsh	Slender glasswort (<i>Salicornia europaea</i>) tidally-flooded forb vegetation	Slender glasswort – Smooth cordgrass (<i>Salicornia europaea</i> - <i>Spartina alterniflora</i>) community	95	4308
8A	Intertidal Marshes	Salt Marsh	Virginia glasswort (<i>Salicornia virginica</i>) tidally-flooded vegetation		95	NA

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
8A	Intertidal Marshes	Brackish Marsh	Smooth cordgrass (<i>Spartina alterniflora</i>) tidally-flooded grasslands	Smooth cordgrass – Eastern lilaepsis (<i>Spartina alterniflora</i> - <i>Lilaeopsis chinensis</i>) community	95	4193
8A	Intertidal Marshes	Brackish Marsh	Common threesquare (<i>Schoenoplectus pungens</i>) tidally-flooded grasslands	Common threesquare – Sturdy bulrush (<i>Schoenoplectus pungens</i> - <i>Schoenoplectus robustus</i>) community	95	4188
8A	Intertidal Marshes	Brackish Marsh	Narrowleaf cattail (<i>Typha angustifolia</i>) tidally-flooded grasslands	Narrowleaf cattail – Rosemallow (<i>Typha angustifolia</i> - <i>Hibiscus moscheutos</i>) community	95	4201
8A	Intertidal Marshes	Brackish Marsh	Saltmeadow cordgrass (<i>Spartina patens</i>) tidally-flooded grasslands	Saltmeadow cordgrass – Inland saltgrass (<i>Spartina patens</i> - <i>Distichlis spicata</i>) community	95	6006
8A	Intertidal Marshes	Brackish Marsh	Saltmeadow cordgrass (<i>Spartina patens</i>) tidally-flooded grasslands	Saltmeadow cordgrass – Creeping bentgrass (<i>Spartina patens</i> - <i>Agrostis stolonifera</i>) community	95	6365
8A	Intertidal Marshes	Freshwater Tidal Marsh	Speckled alder – Silky dogwood – Common winterberry (<i>Alnus incana</i> ssp. <i>rugosa</i> - <i>Cornus</i>		90	6337

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
			<i>amomum - Ilex verticillata</i>) tidally-flooded shrublands			
8A	Intertidal Marshes	Freshwater Tidal Marsh	Annual wildrice (<i>Zizania aquatica</i>) tidally-flooded grasslands	Annual wildrice – Pickerelweed (<i>Zizania aquatica - Pontederia cordata</i>) community	95	4202
8A	Intertidal Marshes	Freshwater Tidal Marsh	Sweetflag (<i>Acorus calamus</i>) tidally-flooded grasslands		95	6833
8A	Intertidal Marshes	Freshwater Tidal Marsh	River bulrush (<i>Schoenoplectus fluviatilis</i>) tidally-flooded grasslands		95	NA
8A	Intertidal Marshes	Freshwater Tidal Marsh	Hairy sedge (<i>Carex lacustris</i>) tidally-flooded grasslands	Hairy sedge – Bluejoint - Canada wildrye (<i>Carex lacustris - Calamagrostis canadensis - Elymus canadensis</i>) community	95	NA
8A	Intertidal Marshes	Freshwater Tidal Marsh	Green arrow arum (<i>Peltandra virginica</i>) tidally-flooded forb vegetation	Green arrow arum – Strawcolored flatsedge (<i>Peltandra virginica - Cyperus strigosus</i>) community	95	4706

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

CT CWCS Key Habitats	Natural Communities	Characteristic Community	Connecticut Vegetation Alliance	Connecticut Vegetation Community	NLCD	NVC CEGLOO-
8A	Intertidal Marshes	Freshwater Tidal Marsh	Sensitive fern (<i>Onoclea sensibilis</i>) tidally-flooded forb vegetation	Sensitive fern – River bulrush – Cattail (<i>Onoclea sensibilis</i> – <i>Schoenoplectus fluviatilis</i> - <i>Typha spp.</i>) community.	95	6325
8A	Intertidal Swamps	Freshwater Intertidal Swamps	Red maple – Green ash (<i>Acer rubrum</i> - <i>Fraxinus pennsylvanica</i>) tidally-flooded woodlands	Red maple – Green ash – Knotweed (<i>Acer rubrum</i> - <i>Fraxinus pennsylvanica</i> – <i>Polygonum spp.</i>) community	90	6165

Connecticut's CWCS Key Habitats
(in column 1 in the above table)

CWCS Key Habitats	Sub-habitats or Vegetative Community
1) Upland Forest	a) Dry Oak Forests on Sand and Gravel
	b) Calcareous Forests
	c) Coniferous Forests
	d) Old Growth Forests
2) Upland Woodland and Shrub	a) Red Cedar Glades
	b) Pitch Pine – Scrub Oak Woodlands
	c) Coastal Shrublands and Heaths
3) Upland Herbaceous	a) Coastal Dunes
	b) Grassy Glades and Balds
	c) Sandplain and other Warm Season Grasslands
	d) Sparsely Vegetated Sand and Gravel
	a) Atlantic White Cedar Swamps

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

4) Forested Inland Wetland	a) Atlantic White Cedar Swamps
	b) Red/Black Spruce Swamps Northern White Cedar Swamps
4) Forested Inland Wetland (cont.)	d) Floodplain Forests
5) Shrub Inland Wetland	a) Bogs, Seeps, and Fens
6) Herbaceous Inland Wetland	a) Calcareous Spring Fens
	b) Freshwater Marshes
7) Sparsely Vegetated Inland Wetland	a) Surface Springs
	b) Vernal Pools
8) Tidal Wetland	a) Tidal Wetlands
	b) Intertidal Beaches and Shores
9) Freshwater Aquatic	a) Large Rivers and Streams and their Associated Riparian Zones
	b) Unrestricted, Free-flowing Streams
	c) Cold Water Streams
	d) Head-of-Tide
	e) Lakes and their Shorelines
	f) Coastal Plain Ponds
10) Estuarine Aquatic	a) Coastal Rivers, Coves, and Embayments
	b) Vegetation Beds
	c) Hard Bottoms
	d) Sponge Beds
	e) Shellfish Reefs/Beds
	f) Sedimentary Bottoms
	g) Open Water
11) Unique or Man-Made Habitats	a) Traprock Ridges (various habitats)
	b) Offshore Islands (various habitats)
	c) Coastal Bluffs and Headlands
	d) Caves and other Subterranean Habitats
	e) Urban Habitat
	a) Early Successional Shrublands and Forests
	b) Cool Season Grasslands
	c) Wet Meadows

Appendix 3: Threats to Connecticut's Wildlife and Habitats and their Links to Conservation Actions and Inventory, Research, and Monitoring Needs

This appendix presents the identified threats to Connecticut's GCN species and key habitats and the associated conservation actions, and research, inventory and monitoring needs that address each threat.

1 Insufficient scientific knowledge regarding wildlife, as well as freshwater, diadromous, and marine fish species and their habitats (distribution, abundance, and condition)

Conserve and increase populations of avian species for which Connecticut has a "global responsibility" for conservation such as blue-winged warbler, saltmarsh sharp-tailed sparrow, greater scaup and worm-eating warbler. Measure: number of conservation projects focused on global responsibility species.

Determine the population status and distribution of GCN raptor species and establish monitoring protocols. Measure: number of species for which population status and distribution has been determined; have monitoring protocols established.

Determine demographic and habitat use for GCN herpetofauna species. Measure: number of GCN species for which demography and habitat use has been determined.

Develop long-term monitoring protocol for Connecticut fish species. Measure: effective monitoring protocols established.

Develop long-term monitoring protocols, participate in coast-wide research and management activities for marine fish and invertebrates. Measure: number of research and monitoring efforts undertaken.

Examine population dynamics of marine fish and invertebrates including effects of density dependent and density independent (e.g. abiotic) factors. Measure: number of research efforts undertaken.

Investigate the causes of reduced stock abundance when the cause is not apparent (e.g. fishing), including whether specific life stages are limited by distribution and abundance of critical habitats. Measure: number of research efforts undertaken.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Enhance conservation of GCN invertebrate species by developing an online database that provides information to the public and facilitates the submission of data by the scientific community. Measure: Development of online database that provides information to the public and facilitates the submission of data by the scientific community.

Assess the status and distribution of bees in Connecticut. Measure: number of research efforts undertaken; number of bee species for which status and distribution has been determined.

Enhance inventory and conservation efforts for butterfly species. Measure: number of new monitoring sites or species protocols established.

Determine eastern box turtle distribution, habitat use and demographics and identify core populations and evaluate their long-term viability. Measure: number of GIS data layers produced; number of acres surveyed; number of new sites surveyed; compilation of new data collected on distribution; number of eastern box turtles located; measures of life history established.

Determine and map the distribution of blue-spotted salamander (diploid) populations. Measure: number of GIS data layers produced.

Determine the life history, abundance, distribution and habitat requirements for GCN bat species, especially Indiana bats. Measure: number of GIS data layers produced and measures of life history established.

Monitor population trends of GCN forest interior bird species (e.g. worm-eating warbler, cerulean warbler) that are not well covered by BBS efforts. Measure: number of species added to improved monitoring protocols.

Determine the population status and distribution of ruffed grouse. Measure: number of GIS data layers produced of all known sites; produce effective monitoring protocols.

Conserve existing populations of least shrews and determine statewide distribution and abundance. Measure: number of GIS data layers produced; number of areas surveyed; number of populations located; compilation of new data collected.

Determine the status and distribution of GCN ground beetle populations. Measure: number of GIS data layers produced; number of areas surveyed; number of species or populations located.

Determine the population status and distribution of breeding populations of common nighthawks. Measure:

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

number of GIS data layers produced of all known sites; produce effective monitoring protocols.

Monitoring population trends of grassland birds within Connecticut and as part regional efforts among other Northeastern states. Measure: report annual trend of grassland birds at Connecticut sites surveyed.

Assess invertebrate populations occurring in coastal strand, trap rock ridges, and high elevation bald habitats. Measure: number of GIS data layers produced; number of areas surveyed; number of species or populations located; compilation of new data collected.

Determine the population status, distribution and breeding success of the American woodcock. Measure: quantify and map breeding population of American woodcock and produce and update conservation plans.

Determine the distribution, abundance and breeding success of American black ducks and assess winter habitat use. Measure: quantify and map breeding population and winter habitats of American black duck and produce and update conservation plans.

Determine the population status and distribution of yellow-billed and black-billed cuckoos. Measure: number of GIS data layers produced of all known nesting sites; develop effective monitoring protocols.

Monitor GCN freshwater and coastal wetland birds in coordination with Partners in Flight and Colonial Bird Monitoring protocols. Measure: number of sites monitored in CT.

Determine distribution and abundance, habitat requirements and demography of southern bog lemmings. Measure: number of GIS data layers produced; number of areas surveyed; number of populations located; compilation of new data collected.

Determine distribution and abundance, habitat requirements and demography of northern water shrews. Measure: number of GIS data layers produced; number of areas surveyed; number of populations located; compilation of new data collected.

Enhance inventory and conservation efforts for Odonate species. Measure: number of new monitoring sites or species protocols established.

Determine and map the current and historic distribution of bog turtles. Measure: number of GIS data layers produced; number of areas surveyed; number of new sites surveyed.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Determine the status and distribution of breeding populations of saltmarsh sharp-tailed sparrow. Measure: number of GIS data layers produced of all known sites; produce effective monitoring protocols.

Identify and map estuarine habitats, particularly spawning and nursery habitats, and quantify their utilization by estuarine species. Measure: number of GIS data layers produced; number of utilization assessments

Determine the value of estuarine and marine habitats to resident fish and invertebrate populations. Measure: number of sites evaluated.

Determine and monitor the distribution, abundance, habitat use and condition of GCN estuarine invertebrate species. Measure: number of GIS data layers produced; number of areas surveyed; number of species or populations located; compilation of new data collected.

Identify and quantify threats to the survival of GCN species. Measure: number of threats identified; and measures of life history established.

Research the basic ecology, biology, behavior, and population dynamics of GCN species. Measure: Measures of life history established.

Enhance inventory and conservation efforts for freshwater mussels. Measure: number of areas surveyed; number of new survey sites; number of species or populations located.

Determine fidelity of GCN fish to individual sites. Measure: number of areas surveyed; number of species or populations located; number of GIS data layers produced; measures of life history established.

Use genetic testing to determine if fish populations (e.g. burbot, brook lamprey) in Connecticut represent remnant (relic) populations vs. temporary range expansions. Measure: number of fish populations identified as remnant populations or temporary range expansions.

Perform genetic analysis of selected trout populations to identify successful wild and hatchery strains and to determine if native strains still exist. Measure: number of sites surveyed; number of species or populations sampled; number of wild and hatchery strains identified; number of native strains identified.

Evaluate performance of stocked Atlantic salmon in Connecticut habitat. Measure: number of marking and research projects designed; funded or conducted.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Collect data on trout populations in rapidly developing watersheds where data are currently unavailable. Measure: number of development areas identified; number of sites surveyed; number of species or populations located; number of GIS data layers produced.

Monitor location and nearby streams where fish populations that may have been extirpated have been previously found. Measure: number of sites surveyed; number of new sites surveyed; number of species or populations

Inventory and determine the status of headwater stream habitats statewide. Measure: number sites surveyed; number of GIS data layers produced; number of fish species trapped, tagged or located; risk assessment conducted.

Investigate and delineate current distributions of fishes that spawn or congregate at the head-of-tide (e.g., rainbow smelt, sea lamprey, and American eel). Measure: number sites surveyed; number of GIS data layers

Inventory and delineate spawning areas of rainbow smelt and Atlantic tomcod. Measure: number sites surveyed; number of GIS data layers produced.

Identify head-of-tide habitat within Connecticut. Measure: number sites surveyed; number of GIS data layers produced.

Periodically monitor fish and invertebrate communities and key physical and chemical indices in lakes and ponds. Measure: number of lakes surveyed.

Quantify, delineate and map habitat (e.g., vegetated areas) in lakes. Measure: number of lakes surveyed; number of GIS data layers produced.

Periodically monitor fish and invertebrate communities and key physical and chemical indices in lakes and ponds. Measure: number of lakes surveyed.

Determine value of marine habitats to resident fish and invertebrate populations. Measure: number of marine habitats evaluated.

Examine egg and larval mortality within discrete areas in LIS, particularly for tautog, determine fecundity and local egg deposition rates. Measures: number of sites sampled; number of sites for which fecundity and egg deposition rates are determined.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Determine the extent and importance of seasonal use of the estuary and Long Island Sound by sturgeon populations. Measure: number of surveys or studies conducted; number of sturgeon documented.

Determine the population status and distribution of chimney swifts and establish effective monitoring protocols. Measure: number of GIS data layers produced of all known sites; produce effective monitoring protocols.

Develop a statewide database for GCN moth species that includes occurrence and seasonal activity information to enhance inventory and conservation efforts. Measure: percentage of GCN moth species for which data have been collected and incorporated into a database.

Conserve and increase New England cottontails and their habitats. Measure: number of habitat areas restored; number of populations located.

Conserve and increase breeding populations of GCN early successional birds especially golden-winged warbler. Measure: number known breeding pairs located statewide.

Develop a statewide database for tabanid and syrphid flies that includes occurrence and seasonal activity information to enhance inventory and conservation efforts. Measure: percentage of GCN fly species for which data have been collected and incorporated into a database.

Conserve and increase breeding populations of GCN grassland birds especially upland sandpiper. Measure: number of breeding pairs.

Identify and protect key grassland areas. Measure: number of sites identified in each of 169 towns; percentage of these sites protected.

Identify, protect and manage diamondback terrapin populations. Measure: number of nesting sites identified and protected.

Identify, monitor and develop management plans to protect puritan tiger beetle populations and their habitat. Measure: number of plans or permits commented on; number of cooperative habitat protection projects; number project partnerships established.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Determine the distribution, abundance, condition and limiting factors (threats) for all GCN species and key habitats. Measure: number of research and survey efforts initiated.

Continue to participate in regional conservation efforts for GCN species such as Indiana bat, puritan tiger beetle, New England cottontail, timber rattlesnake, golden-winged warbler, cerulean warbler, Atlantic and shortnose sturgeon, American eel and winter flounder. Measure: number of regional conservation efforts participated in for

Implement all existing recovery plans and management plans for GCN species in Connecticut. Measure: number of plans implemented.

Develop and implement inventory, survey and monitoring protocols to determine and track the status and condition of key habitats. Measure: number of inventories developed.

Develop an improved data collection, management, and retrieval system to track the status of GCN species and key habitats. Measure: development of a data management system.

Map key habitats at the landscape level to determine and monitor their status and condition in Connecticut. Measure: number of landscape level maps and mapping tools developed.

Identify key GCN bat flight and migratory corridors and enhance roosting, nursery, and feeding habitats and water resources. Measure: number of areas identified.

Periodically monitor fish and invertebrate communities, and key physical and chemical indices in lakes and ponds. Measure: number of lakes surveyed

2 Loss, degradation or fragmentation of habitats from development or changes in land use

Conserve and increase populations of avian species for which Connecticut has a "global responsibility" for conservation such as Blue-winged Warbler, Saltmarsh Sharp-tailed Sparrow, Greater Scaup and Worm-eating Warbler. Measure: number of conservation projects focused on global responsibility species species.

Develop BMPs for the conservation of GCN herpetofauna species for use by municipalities and land managers. Measure: number of BMPs developed.

Determine eastern box turtle distribution, habitat use and demographics and identify core populations and evaluate their long-term viability. Measure: number of GIS data layers produced; number of acres surveyed; number of new sites surveyed; compilation of new data collected on distribution; number species located; measures of life history established.

Determine the life history, abundance, distribution and habitat requirements for GCN bat species, especially Indiana bats. Measure: number of GIS data layers produced and measures of life history established.

Determine the status and distribution of GCN ground beetle populations. Measure: number of GIS data layers produced; number of areas surveyed; number of species and populations located.

Determine and map the current and historic distribution of bog turtles. Measure: number of GIS data layers produced; number of areas surveyed; number of new sites surveyed.

Enhance inventory and conservation efforts for freshwater mussels. Measure: number of areas surveyed; number of new survey sites; number of species and populations located.

Conserve and increase breeding populations of GCN early successional birds especially golden-winged warbler. Measure: number known breeding pairs located statewide.

Implement specialized management techniques (e.g., burning) to benefit certain GCN species. Measure: number of acres managed.

Conserve and increase breeding populations of GCN grassland birds especially upland sandpiper. Measure: number of breeding pairs.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Identify and protect key grassland areas. Measure: number of sites identified in each of 169 towns; percentage of these sites protected.

Conserve temporary and vernal pool breeding sites and their surrounding upland habitats. Measure: number of vernal pools identified and protected.

Provide technical assistance to regulatory staff to ensure head-of-tide habitats are offered maximum protection from degradation by future development. Measure: number media or outreach products developed; number presentations given; number regulatory staff contacted.

Conduct comprehensive permit reviews on all regulated activities in head-of-tide habitat. Measure: number permits reviewed.

Restore caves and mines not currently used by GCN bat species to provide suitable habitat conditions. Measure: number of sites restored; number of GIS data layers produced of cave and mine locations.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline "tools" (e.g., BMP manuals, management plans) developed.

3 Degradation of habitats by non-native invasive species (e.g. phragmites, purple loosestrife, mute swan)

Determine and map the distribution of blue-spotted salamander (diploid) populations. Measure: number of GIS data layers produced.

Conserve and increase breeding populations of GCN freshwater and coastal wetland birds. Measure: number breeding pairs identified statewide.

Conserve and enhance bog turtle populations and their habitats. Measure: number of acres protected in Buffers, conservation easements, purchases; of plans or permits commented on; number of cooperative habitat protection projects.

Implement wetland restoration and enhancement projects that benefit GCN species. Measures: number of wetland restoration projects conducted; number of acres restored.

Implement plan to prioritize and address problems caused by invasive aquatic nuisance species. Measure: number of media or outreach products; enforcement efforts; monitoring efforts; reapid response efforts and control efforts undertaken.

Evaluate the impact of invasive plant and animal species on GCN species and habitats, and develop applicable management strategies. Measures: number of management strategies developed; number of management strategies implemented.

4 Lack of resources to maintain and enhance wildlife habitat

Reverse the decline of the marine fish and invertebrate populations where the cause is known and effective action can be identified. Measure: number of management plans developed; number of management actions

Determine and map the distribution of blue-spotted salamander (diploid) populations. Measure: number of GIS data layers produced.

Determine the life history, abundance, distribution and habitat requirements for GCN bat species, especially Indiana bats. Measure: number of GIS data layers produced and measures of life history established.

Determine and map the current and historic distribution of bog turtles. Measure: number of GIS data layers

produced; number of areas surveyed; number of new sites surveyed.

Conserve and increase New England cottontails and their habitats. Measure: number of habitat areas restored; number of populations located.

Conserve and increase breeding populations of GCN grassland birds especially upland sandpiper. Measure: number of breeding pairs.

Develop partnerships (e.g., DEP divisions, NGOs, local governments) and encourage cooperation among agencies to protect head-of-tide locations that are relatively non-degraded through acquisition and appropriate management. Measure: number of partnerships developed; number of stakeholders and agencies contacted; number outreach products produced; number presentations given.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Implement all existing recovery plans and management plans for GCN species in Connecticut. Measure: number of plans implemented.

5 Lack of landscape-level conservation efforts

Develop BMPs for the conservation of GCN herpetofauna species for use by municipalities and land managers. Measure: number of BMPs developed.

Monitoring population trends of grassland birds within Connecticut and as part regional efforts among other Northeastern states. Measure: report annual trend of grassland birds at CT sites surveyed.

Determine and map the current and historic distribution of bog turtles. Measure: number of GIS data layers produced; number of areas surveyed; number of new sites surveyed.

Develop partnerships (e.g., DEP divisions, NGOs, local governments) and encourage cooperation among agencies to protect head-of-tide locations that are relatively non-degraded through acquisition and appropriate

management. Measure: number of partnerships developed; number of stakeholders and agencies contacted; number outreach products produced; number presentations given.

Disseminate information to local government commissions and watershed associations to ensure awareness of critical head-of-tide habitats. Measure: number media or outreach products developed and disseminated; number presentations given.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

Continue to participate in regional conservation efforts for GCN species such as Indiana bat, puritan tiger beetle, New England cottontail, timber rattlesnake, golden-winged warbler, cerulean warbler, Atlantic and shortnose sturgeon, American eel and winter flounder. Measure: number of regional conservation efforts participated in for

Enhance efforts to provide current information and guidance on GCN species and key habitats to land use planners, decision-makers and the public at the local, region and statewide scale. Measure: number of information and outreach products developed and distributed.

Implement programs promoting conservation of GCN species and their habitats. Measure: number of programs implemented.

Develop Best Management Practices (BMP) for GCN bats for use by federal, state, municipal and private land managers to conserve and enhance bat populations. Measure: number of BMPs developed.

6 Public indifference toward conservation

Promote public awareness about urban GCN mammals and their habitats Measure: number of informational programs developed.

Develop and promote legislation to protect GCN herpetofauna species. Measure: General Assembly approval of conservation legislation.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Enhance conservation of collectible and poached species by improving monitoring of sites and law enforcement efforts. Measure: number of sites monitored; number of law enforcement actions.

Promote public awareness of the vulnerability of box turtle populations and the negative impacts of removing turtles from the wild. Measure: number of informational or outreach products developed; number of presentations

Conserve temporary and vernal pool breeding sites and their surrounding upland habitats. Measure: number of vernal pools identified and protected.

Conserve and increase breeding populations of GCN freshwater and coastal wetland birds. Measure: number breeding pairs identified statewide.

Disseminate information to local government commissions and watershed associations to ensure awareness of critical head-of-tide habitats. Measure: number media or outreach products developed and disseminated; number presentations given.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline "tools" (e.g., BMP manuals, management plans) developed.

Enhance efforts to provide current information and guidance on GCN species and key habitats to land use planners, decision-makers and the public at the local, region and statewide scale. Measure: number of informational and outreach products developed and distributed.

Implement programs promoting conservation of GCN species and their habitats. Measure: number of programs implemented.

7 Loss of early successional habitats through natural succession

Conserve and increase breeding populations of GCN early successional birds especially golden-winged warbler. Measure: number known breeding pairs located statewide.

Implement specialized management techniques (e.g., burning) to benefit certain GCN species. Measure: number of acres managed.

Conserve and enhance bog turtle populations and their habitats. Measure: number of acres protected in

Buffers, conservation easements, purchases; of plans or permits commented on; number of cooperative habitat protection projects.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

8 Lack of wildlife conservation on most private lands

Develop BMPs for the conservation of GCN herpetofauna species for use by municipalities and land managers. Measure: number of BMPs developed.

Conserve and increase New England cottontails and their habitats. Measure: number of habitat areas restored; number of populations located.

Conserve and increase breeding populations of GCN colonial or beach nesting birds. Measure: number known breeding pairs statewide based on regional triennial survey.

Conserve and increase breeding populations of GCN freshwater and coastal wetland birds. Measure: number breeding pairs identified statewide.

Identify, monitor and develop management plans to protect puritan tiger beetle populations and their habitat. Measure: number of plans or permits commented on; number of cooperative habitat protection projects; number project partnerships established.

Encourage property owners to maintain natural shoreline habitat (e.g., riparian and shallow water vegetation, downed trees). Measure: number of media or outreach products developed; and number of shoreline miles enhanced or restored.

Restore caves and mines not currently used by GCN bat species to provide suitable habitat conditions. Measure: number of sites restored; number of GIS data layers produced of cave and mine locations.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of

projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

Enhance efforts to provide current information and guidance on GCN species and key habitats to land use planners, decision-makers and the public at the local, region and statewide scale. Measure: number of informational or outreach products developed and distributed.

Develop Best Management Practices (BMP) for GCN bats for use by federal, state, municipal and private land managers to conserve and enhance bat populations. Measure: number of BMPs developed.

9 Illegal collection or poaching of wildlife species

Develop and promote legislation to protect GCN herpetofauna species. Measure: General Assembly approval of conservation legislation.

Increase law enforcement efforts (including inter-agency cooperation) to stop illegal trade and commercialization of GCN species. Measure: number man-hours devoted to the illegal trade and commercialization of GCN

Enhance conservation of collectible and poached species by improving monitoring of sites and law enforcement efforts. Measure: number of sites monitored; number of law enforcement actions.

Promote public awareness of the vulnerability of box turtle populations and the negative impacts of removing turtles from the wild. Measure: number of informational or outreach products developed; number of presentations

Implement specialized management techniques (e.g., burning) to benefit certain GCN species. Measure: number of acres managed.

10 Lack of data exchange (access to and submission of information) for the public and scientific community

Enhance conservation of GCN invertebrate species by developing an online database that provides information to the public and facilitates the submission of data by the scientific community. Measure: Development of online database that provides information to the public and facilitates the submission of data by the scientific community.

Enhance inventory and conservation efforts for butterfly species. Measure: number of new monitoring sites or

species protocols established.

Enhance inventory and conservation efforts for Odonate species. Measure: number of new monitoring sites or species protocols established.

Develop a statewide database for GCN moth species that includes occurrence and seasonal activity information to enhance inventory and conservation efforts. Measure: percentage of GCN moth species for which data have been collected and incorporated into a database.

Develop a statewide database for tabanid and syrphid flies that includes occurrence and seasonal activity information to enhance inventory and conservation efforts. Measure: percentage of GCN fly species for which data is collected and incorporated into a database.

Develop an improved data collection, management, and retrieval system to track the status of GCN species and key habitats. Measure: development of a data management system.

11 Unintentional damage, injury or mortality due to fishing (e.g., incidental catch, injuries from fishing gear)

Minimize or eliminate unintentional injury or mortality to resources due to fishing. Measures: number of gear studies conducted; number of management actions adopted.

12 Predation, competition, displacement from habitat of native GCN species, or disease transmission to GCN species especially from or due to non-native, nuisance species

Examine food habits of dominant predators. Measures: number of predator stomachs analyzed; number and taxa of prey species examined.

Implement plan to prioritize and address problems caused by invasive aquatic nuisance species. Measure: number of media or outreach products; enforcement efforts; monitoring efforts; rapid response efforts and control efforts undertaken.

Avoid stocking domestic trout on top of significant wild populations. Measure: criteria developed for identifying significant wild populations.

Evaluate the impact of invasive plant and animal species on GCN species and habitats and develop

applicable management strategies. Measures: number of management strategies developed; number of management strategies implemented.

13 Disturbance, destruction, alteration or loss of critical habitat structure or function

Implement wetland restoration and enhancement projects that benefit GCN species. Measures: number of wetland restoration projects conducted; number of acres restored.

Minimize disturbance of spawning habitat of horseshoe crabs. Measure; number of technical assistance or outreach products developed and distributed; number of spawning areas protected.

Protect habitat in coastal coves and embayments that historically supported bay scallop populations. Measure: number of impact assessments conducted; number of habitat protection plans developed and implemented.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

Enhance efforts to provide current information and guidance on GCN species and key habitats to land use planners, decision-makers and the public at the local, region and statewide scale. Measure: number of informational and outreach products developed and distributed.

Implement programs promoting conservation of GCN species and their habitats. Measure: number of programs implemented.

Work with the DEP's Environmental Quality Branch, Department of Agriculture's Bureau of Aquaculture, and municipalities to protect water quality and minimize impacts to GCN species and the seabed due to dredging and sediment removal and replacement. Measure: number of management plans adopted; number of habitat or environmental recovery plans adopted.

14 Adverse impacts from temperature shifts, including widespread long-term (e.g., global warming) and local short-term impacts (e.g., temporary power plant shutdowns)

Determine level of existing degradation, threat of future degradation, and opportunities for conservation. *Measure:* number sites surveyed; number studies conducted.

15 Effects of residual levels of pollution in sediments, water contamination, nutrients and pesticides

Determine if contaminants are impacting spawning success, particularly for sturgeon. Measures: number of sites monitored; number of species sampled for contaminants.

When pesticides must be used, encourage the use of those that have minimal effect on non-target species and the environment. Measures: number of technical assistance or outreach products developed and distributed; number of presentations given; meetings attended.

Work with the DEP Environmental Quality Branch to mitigate the effects of residual levels of sediment pollution, water contamination, nutrient and pesticides. Measure: number of mitigation strategies developed and implemented.

Work with the DEP's Environmental Quality Branch, Department of Agriculture's Bureau of Aquaculture, and municipalities to protect water quality and minimize impacts to GCN species and the seabed due to dredging and sediment removal and replacement. Measure: number of management plans adopted; number of habitat or environmental recovery plans adopted.

16 Degradation, alteration and loss of habitat due to stream channel modifications, dams, channelization, filling, dredging, development, sedimentation, vegetation control and shoreline modification

Provide technical assistance to Agency regulatory staff to minimize degradation of habitat and effects on fishes due to dredging and other habitat alterations. Measure: reduction in the extent of habitat degradation.

Identify existing free-flowing systems at risk. Measure: number of risk assessments conducted; number of GIS data layers produced.

Enhance inventory and conservation efforts for freshwater mussels. Measure: number of areas surveyed; number of new survey sites; number of species or populations located.

Determine level of existing degradation, threat of future degradation, and opportunities for conservation. Measure: number sites surveyed; number studies conducted.

Implement wetland restoration and enhancement projects that benefit GCN species. Measures: number of wetland restoration projects conducted; number of acres restored.

Remove dams and barriers where appropriate. Measure: number of dams and barriers removed; miles of stream restored.

Encourage property owners to maintain natural shoreline habitat (e.g., riparian and shallow water vegetation, downed trees). Measure: number of media or outreach products developed; and number of shoreline miles enhanced or restored.

Build fishways or refine methods for providing upstream passage where appropriate. Measure: number of fishways designed; funded or constructed.

Encourage selective vegetation control as opposed to whole lake treatments. Measure: number of Media or outreach products developed.

Mitigate impacts of drawdowns and chemical vegetation control. Measure: number of media or outreach products developed; number of regulations developed and implemented; number of research projects designed, funded or conducted; number of habitats enhanced or restored.

17 Fragmentation of populations and loss of access to upstream and spawning habitat due to impediments to fish movements such as dams, barriers, culverts and tide gates

Identify existing free-flowing systems at risk. Measure: number of risk assessments conducted; number of GIS data layers produced.

Determine level of existing degradation, threat of future degradation, and opportunities for conservation. Measure: number sites surveyed; number studies conducted.

Remove dams and barriers where appropriate. Measure: number of dams and barriers removed; number of stream miles restored.

Build fishways or refine methods for providing upstream passage where appropriate. Measure: number of fishways designed; funded or constructed.

Assess the effectiveness of existing facilities to pass fish. Measure: number of sites surveyed; number of Species and populations located, and number of facilities identified as effective or ineffective for fish passage.

Develop fish passage projects at barriers. Measure: number of fishways designed; funded and constructed.

18 Impacts of point and non-point source pollution

Determine if contaminants are impacting spawning success, particularly for sturgeon. Measures: number of sites monitored; number of species sampled for contaminants.

Work with the DEP Environmental Quality Branch to mitigate the effects of residual levels of sediment pollution, water contamination, nutrient and pesticides. Measure: number of mitigation strategies developed and implemented

Develop appropriate management strategies for lake watersheds to reduce eutrophication including stormwater management. Measure: literature review conducted, number of media or outreach products developed, and number of strategies for lake watersheds developed.

19 Impacts of excessive boat activity (wake wash, sediment suspension, prop scarring)

Reduce impacts of human disturbance to GCN species. Measures: number of management actions and outreach efforts conducted to reduce human impacts.

20 Instream flow alterations and increasing temperatures caused by consumptive withdrawals of surface or ground water and wetland loss

Protect critical habitat, groundwater and minimum flows for lakes and streams containing fish populations. Measure: number of information and outreach products developed; number of regulations implemented; and extent of habitats protected.

Research effects of drawdowns, dredging and other vegetation control activities. Measure: number of before-and-after or correlation studies designed; funded and conducted; and number of BMPs developed and

Encourage cooperation among agencies (DEP divisions, local governments, etc.) and other stakeholders to protect free-flowing streams from over-allocation of surface and groundwater resources. Measure: number of media or outreach products developed; number of presentations given and number of stakeholders contacted or assisted.

21 Impacts of water diversions that reduce stream flows resulting in fish mortality, loss of habitat and interference with migration

Protect critical habitat, groundwater and minimum flows for lakes and streams containing fish populations. Measure: number of information and outreach products developed; number of regulations implemented; and

extent of habitats protected.

Identify existing free-flowing systems at risk. Measure: number of risk assessments conducted; number of GIS data layers produced.

Encourage cooperation among agencies (DEP divisions, local governments, etc.) and other stakeholders to protect free-flowing streams from over-allocation of surface and groundwater resources. Measure: number of media or outreach products developed; number of presentations given and number of stakeholders contacted or assisted.

Provide technical assistance to regulatory staff to minimize impacts of fish entrainment at industrial water intakes. Measure: number of media or outreach products developed; number of presentations given and number of regulatory staff contacted or assisted.

22 Impacts to fish habitats due to ineffective or insufficient municipal land use regulations

Promote effective state and local regulations for the conservation of aquatic habitats. Measure: number of state and local regulations developed that benefit aquatic habitats.

Research effect of riparian buffer width on quality and stability of habitat on aquatic systems. Measure: number of before-and-after or correlation studies designed, funded and conducted; appropriate buffer dimensions determined.

Provide technical assistance to regulatory staff to ensure head-of-tide habitats are offered maximum protection from degradation by future development. Measure: number media or outreach products developed; number presentations given; number regulatory staff contacted or assisted.

Disseminate information to local government commissions and watershed associations to ensure awareness of critical head-of-tide habitats. Measure: number media or outreach products developed and disseminated; number presentations given.

Mitigate impacts of drawdowns and chemical vegetation control. Measure: number of media or outreach products developed; number of regulations developed and implemented; number of research projects designed, funded or conducted; number of habitats enhanced or restored.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

23 Adverse impacts to fish from lake manipulations (e.g. excessive vegetation control, water level manipulation, dredging)

Provide technical assistance to Agency regulatory staff to minimize degradation of habitat and effects on fishes due to dredging and other habitat alterations. Measure: reduction in the extent of habitat degradation.

Research effects of drawdowns, dredging and other vegetation control activities. Measure: number of before-and-after or correlation studies designed; funded and conducted; and number of BMPs developed and

Encourage selective vegetation control as opposed to whole lake treatments. Measure: number of Media or outreach products developed.

Mitigate impacts of drawdowns and chemical vegetation control. Measure: number of media or outreach products developed; number of regulations developed and implemented; number of research projects designed, funded or conducted; number of habitats enhanced or restored.

Develop, promote and enforce effective drawdown management. Measure: number applied management recommendations identified from research results; number of media or outreach products developed; number of recommendations enforced through permits.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

24 Loss of oxygenated hypo-limnetic and meta-limnetic zones due to excessive nutrient run-off and vegetation control

Develop appropriate management strategies for lake watersheds to reduce eutrophication including stormwater management. Measure: literature review conducted, number of media or outreach products developed, and number of strategies for lake watersheds developed.

25 Disruption of fish migrations due to dredging and development

Build fishways or refine methods for providing upstream passage where appropriate. Measure: number of fishways designed; funded or constructed.

26 Loss of coldwater habitat due to decreased groundwater input or increased warming (e.g. wetlands filling, impoundment, removal of riparian vegetation)

Research effects of drawdowns, dredging and other vegetation control activities. Measure: number of before-and-after or correlation studies designed; funded and conducted; and number of BMPs developed and

Identify and quantify surface springs, seeps, coldwater streams and thermal refuges. Measure: number sites surveyed; number of GIS data layers produced.

Encourage cooperation among agencies (DEP divisions, local governments, etc.) and other stakeholders to protect free-flowing streams from over-allocation of surface and groundwater resources. Measure: number of media or outreach products developed; number of presentations given and number of stakeholders contacted or assisted.

Protect habitat in streams that support coldwater fish communities. Measure: number coldwater streams identified; number areas of habitat defined; number stream miles protected.

Develop appropriate management strategies for lake watersheds to reduce eutrophication including stormwater management. Measure: literature review conducted, number of media or outreach products developed, and number of strategies for lake watersheds developed.

27 Impacts to coldwater habitats from beaver dams that result in ponding and warming, fragmentation of habitat and increased sedimentation and nutrient loading

Identify and quantify surface springs, seeps, coldwater streams and thermal refuges. Measure: number sites surveyed; number of GIS data layers produced.

Implement wetland restoration and enhancement projects that benefit GCN species. Measures: number of wetland restoration projects conducted; number of acres restored.

Remove dams and barriers where appropriate. Measure: number of dams and barriers removed; miles of stream restored.

Protect habitat in streams that support coldwater fish communities. Measure: number coldwater streams identified; number areas of habitat defined; number stream miles protected.

Develop appropriate management strategies for lake watersheds to reduce eutrophication including stormwater management. Measure: literature review conducted, number of media or outreach products developed, and number of strategies for lake watersheds developed.

28 Lack of fire needed to maintain certain habitats

Conserve and increase breeding populations of GCN grassland birds especially upland sandpiper. Measure: number of breeding pairs.

29 Unauthorized use of motorized vehicles, which disturb wildlife (e.g. ATVs, jet skis)

Conserve and increase breeding populations of GCN colonial or beach nesting birds. Measure: number known breeding pairs statewide based on regional triennial survey.

Reduce impacts of human disturbance to GCN species. Measures: number of management actions and outreach efforts conducted to reduce human impacts.

30 Lack of stand age and structural diversity, and understory diversity among upland forests

Implement specialized management techniques (e.g., burning) to benefit certain GCN species. Measure: number of acres managed.

31 Degradation of habitat from over-browsing by deer.

Evaluate and implement options to minimize impacts from over-browsing by deer to GCN species. Measures: number of options evaluated and implemented.

Conserve and increase breeding populations of GCN early successional birds especially golden-winged warbler. Measure: number known breeding pairs located statewide.

Conserve and increase breeding populations of GCN early successional birds especially yellow-breasted chat. Measure: number known breeding pairs statewide.

32 Degradation of habitat from insects and disease

Evaluate the impact of invasive plant and animal species on GCN species and habitats and develop applicable management strategies. Measures: number of management strategies developed; number of management strategies implemented.

33 Loss of large forest blocks (e.g., 2,000 acres +) with unbroken canopy

Monitor population trends of GCN forest interior bird species (e.g. worm-eating warbler, cerulean warbler) that are not well covered by BBS efforts. *Measure:* number of species added to improved monitoring protocols.

Work with conservation partners to conserve GCN species and key habitats statewide. *Measures:* number of projects implemented with partners.

Evaluate and implement options to minimize impacts from over-browsing by deer to GCN species. *Measures:* number of options evaluated and implemented.

34 Loss of wetland habitat from historic filling, dredging and ditching

Conserve and increase breeding populations of GCN freshwater and coastal wetland birds. Measure: number breeding pairs identified statewide.

Implement wetland restoration and enhancement projects that benefit GCN species. Measures: number of wetland restoration projects conducted; number of acres restored.

35 Impacts to prey species form predation by striped bass in the Connecticut River

Examine food habits of dominant predators. Measure: number of predator stomachs analyzed; number of taxa of prey species examined.

36 Loss of habitat value due to hydrologic impacts from development, new roads, impervious surfaces and culverts

Develop standards for road crossings and road design (curbs, box culverts, etc.) to reduce road mortality of GCN herpetofauna species. Measure: number of municipalities using new standards.

Determine eastern box turtle distribution, habitat use and demographics and identify core populations and evaluate their long-term viability. Measure: number of GIS data layers produced; number of acres surveyed; number of new sites surveyed; compilation of new data collected on distribution; number species located; measures of life history established.

Conserve and enhance bog turtle populations and their habitats. Measure: number of acres protected in Buffers, conservation easements, purchases; of plans or permits commented on; number of cooperative habitat protection projects.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

37 Impacts from development to upland buffers

Develop BMPs for the conservation of GCN herpetofauna species for use by municipalities and land managers. Measure: number of BMPs developed.

Conserve temporary and vernal pool breeding sites and their surrounding upland habitats. Measure: number of vernal pools identified and protected.

Conserve and enhance bog turtle populations and their habitats. Measure: number of acres protected in Buffers, conservation easements, purchases; of plans or permits commented on; number of cooperative habitat protection projects.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

38 Impacts from development to upland migration corridors associated with vernal pools

Develop BMPs for the conservation of GCN herpetofauna species for use by municipalities and land managers. Measure: number of BMPs developed.

Develop standards for road crossings and road design (curbs, box culverts, etc.) to reduce road mortality of GCN herpetofauna species. Measure: number of municipalities using new standards.

Conserve temporary and vernal pool breeding sites and their surrounding upland habitats. Measure: number of vernal pools identified and protected.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

39 Impacts to (e.g. tree cutting) and loss of riparian habitat for wildlife corridors and insufficient buffer requirements to protect streams

Determine the life history, abundance, distribution and habitat requirements for GCN bat species, especially Indiana bats. Measure: number of GIS data layers produced and measures of life history established.

Research effect of riparian buffer width on quality and stability of habitat on aquatic systems. Measure: number of before-and-after or correlation studies designed, funded and conducted; appropriate buffer dimensions determined.

Encourage property owners to maintain natural shoreline habitat (e.g., riparian and shallow water vegetation, downed trees). Measure: number of media or outreach products developed; and number of shoreline miles enhanced or restored.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

Develop statewide guidelines to minimize the impacts of residential and industrial development on GCN species. Measure: number of guideline “tools” (e.g., BMP manuals, management plans) developed.

40 Impacts from human disturbance

Determine the status and distribution of GCN ground beetle populations. Measure: number of GIS data layers produced; number of areas surveyed; number of species or populations located.

Conserve and increase breeding populations of GCN colonial or beach nesting birds. Measure: number known breeding pairs statewide based on regional triennial survey.

Reduce impacts of human disturbance to GCN species. Measures: number of management actions and outreach efforts conducted to reduce human impacts.

Conserve and increase breeding populations of GCN freshwater and coastal wetland birds. Measure: number breeding pairs identified statewide.

Minimize disturbance of spawning habitat of horseshoe crabs. Measure; number of technical assistance or outreach products developed and distributed; number of spawning areas protected.

Identify, monitor and develop management plans to protect puritan tiger beetle populations and their habitat. Measure: number of plans or permits commented on; number of cooperative habitat protection projects; number project partnerships established.

Work with conservation partners to conserve GCN species and key habitats statewide. Measures: number of projects implemented with partners; number of acres conserved.

41 Adverse effects from hypoxia and other water quality impairments, and habitat alterations in Long Island Sound

Determine value of marine habitats to resident fish and invertebrate populations. Measure: number of marine habitats evaluated.

42 Impacts to micro-climate caused by habitat alterations (e.g. tree cutting)

Identify and quantify surface springs, seeps, coldwater streams and thermal refuges. Measure: number sites surveyed; number of GIS data layers produced.

Restore caves and mines not currently used by GCN bat species to provide suitable habitat conditions. Measure: number of sites restored; number of GIS data layers produced of cave and mine locations.

Protect habitat in streams that support coldwater fish communities. Measure: number coldwater streams identified; number areas of habitat defined; miles of stream protected.

43 Delayed recovery of species with depressed populations due to limited reproductive potential, dispersal ability, or other factors

Monitor stock structure, species movements, abundance and distribution, by life stage. Measure: number of species for which this information has been collected.

Reverse the decline of the marine fish and invertebrate populations where the cause is known and effective action can be identified. Measure: number of management plans developed; number of management actions

Investigate the causes of reduced stock abundance when the cause is not apparent (e.g. fishing), including whether specific life stages are limited by distribution and abundance of critical habitats. Measure: number of research efforts undertaken.

Stock trout strains most likely to establish self-sustaining wild populations into waters selected for special management. Measure: number of fish produced and released.

Continue stocking juvenile life stages of Atlantic salmon. Measure: number of fish produced and released.

Appendix 4: Compilation and Prioritization of Conservation Actions and Threats from Existing State, Regional, National and International Conservation Plans

This appendix lists conservation actions identified in existing, local, state, national, and international conservation plans compiled from extensive research. It also lists the major threats identified in these plans and sources of information pertaining to those actions. This list represents the original compilation that was used as a starting point and foundation from which the DEP BNR and its partners began their prioritization process. A priority classification system, high (H), moderate (M), and low (L), was used to rank those actions believed to be important for Connecticut. Actions were linked to threats identified in these plans. This compilation documents the prioritization process for all conservation actions. Regardless of final ranking, all are retained in this compilation and will serve as a clearinghouse for reference, updates, and revisions. This appendix addresses Elements 4 and 5.

The first section on conservation actions for Marine Fisheries provides an example of the initial ranking process applied to all conservation actions. This section is for informational purposes only. It includes a column, “priority” which allowed participants to assign a rank of high, moderate, or low to each action. In addition, the DEP Marine Fisheries Division reviewed and modified the draft conservation actions. Some of the draft action items not suitable for SWG activities were deleted. Actions items that were outside the purview, or not relevant to Marine Fisheries, also were deleted. This refinement and culling-out process was applied to all the initial conservation actions for each taxonomic group, however, only the Marine Fisheries listing includes the illustrative column for priority ranking. **It is important to note that ultimately only action items receiving a rank of high were featured in chapter 4 of the CWCS.**

Prioritization Process - Instructions to reviewers:

- **Review and edit text of individual Conservation Actions, using the track changes feature in Word; focus especially on areas where you can add specific details or quantitative objectives and outcomes for the Action**
- **Combine and edit text of two or more individual Conservation Actions to cluster and condense viable Actions**
- **Delete individual Conservation Actions that are not appropriate**
- **Add new Conservation Actions to address unidentified needs or areas**
- **Edit (add/delete numbers) “Threat Addressed” column and/or edit/add new Threat Categories and Codes**
- **Edit “Source Code” column and codes– suggest additional sources for Conservation Actions**
- **Rank in the Priority Column – either classify each as either “H” high priority; “M” moderate priority; or “L” low priority or give actual number rank (1 being Highest)**

**MARINE FISH: Compilation of Conservation Actions for Connecticut
from Existing Management Plans and Literature**

Source Codes:

- 1 = AFS Policy Statement 31a: Protection of Marine Fish Stocks at Risk of Extinction
- 2 = AFS Policy Statement #31b: Management of Sharks and Their Relatives (*Elasmobranchii*)
- 3 = AFS Policy Statement #31c: Long-lived Reef Fishes: The Grouper-Snapper Complex
- 4 = Musick et al. (2000): Marine, Estuarine and Diadromous Fish ... at Risk of Extinction
- 5 = Williams et al. (1989): Fishes of North America Endangered, Threatened ...
- 6 = Pew Oceans Commission: Boesch et al. (2001) Marine Pollution in the United States
- 7 = Pew Oceans Commission: Dayton et al. (2002) Ecological Effects of Fishing
- 8 = Pew Oceans Commission (2003): America's Living Oceans: Charting a Course for Sea Change. A Report to the Nation, Recommendations for a New Ocean Policy
- 9 = Pew Oceans Commission: Beach (2002) Coastal Sprawl – Effects on Aquatic Ecosystems
- 10 = Carlton (2001): Introduced Species in U.S. Coastal Waters: Environmental Impacts and Management Priorities
- 11 = NEFMC (1998): Essential Fish Habitat
- 12 = NOAA (2002): Status of U.S. Fisheries – 2001
- 13 = ASMFC (1991): Interstate Fisheries of the Atlantic Coast
- 14 = Jacobs and O'Donnell (2002): A Fisheries Guide to Lakes and Ponds of Connecticut
- 15 = 2003 Connecticut Angler's Guide
- 16 = NEES&WDTC (draft)
- 17 = The Nature Conservancy (comment letter of October 27, 2003)
- 18 = TNC (1999): North Atlantic Coast Ecoregional Conservation Plan
- 19 = TNC (2003): Lower New England – Northern Piedmont Ecoregional Conservation Plan
- 20 = CT OPM (1998): Conservation and Development Policies Plan for Connecticut, 1998-2003
- 21 = Wahle and Balcom (2002): Living Treasures: The Plants and Animals of Long Island Sound
- 22 = CT DEP (1984): Marine Resources Management Plan for the State of Connecticut

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

- 23 = Long Island Sound Study 1994 Comprehensive Management Plan
- 24 = Long Island Sound Study 2003 Plan
- 25 = Jacobs et al. (1999): A Management Plan for Bass in Connecticut Waters and Recommendations for Other Warmwater Species
- 26 = Hyatt et al. (1999): A Trout Management Plan for Connecticut's Rivers and Streams
- 27 = CT DEP Marine Fisheries Recommendations, March 22, 2004
- 28 = NMFS, Atlantic Sea Herring (*Clupea harengus harengus*) FMP (1999)
- 29 = CT DEP (2001): The Connecticut Green Plan: Open Space Acquisition, Fiscal Years 2001-2006

Threat Addressed by Conservation Action Codes:

- 1= Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction projects, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)
- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in long island sound and estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

20 = Unplanned urban development and growth (lack of landowner incentives, inability to control or influence private land development under local jurisdiction, lack of information to municipalities, population growth, changing economy, etc.)

21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	Habitat-Focused Conservation Action	Threat Addressed	Source
M	Adopt and implement a policy to not allow any net loss of wetlands; consider wetlands banking as a tool	1	11, 20
M	Facilitate the restoration of salt marshes and other estuarine habitats to promote the recovery of fishery resources and enhance important habitats (e.g., Massachusetts Wetlands Restoration and Banking Program)	1	11
M	Prohibit the use of mobile bottom fishing gear in habitat areas known to be especially sensitive to disturbance from such gear, including but not limited to coral-reef and deepwater coral habitats, complex rocky bottoms, seamounts, kelp forests, seagrass beds, and sponge habitats	1, 6	8
M	Site at-sea aquaculture and fish processing facilities in the least environmentally harmful locations; consider EFH designations in the development and construction of any aquaculture and processing operation; discourage these activities in HAPC	1, 14	11
M	Coordinate the development of a comprehensive dredging and dredged material disposal plan to improve and maintain access to ports, harbors, and channels, and to minimize adverse impacts to sensitive habitats	1, 2, 6, 21	11
H	Restrict timing of dredging of channels or dredged material disposal to avoid impacting the habitat of migratory fish (e.g. Atlantic salmon), spawning fish (e.g. winter flounder), or critical life stages (e.g. larval and juvenile fishes)	1, 5, 6, 7	11
M	Restore tidal flows to coves, embayments, tidal rivers, and tidal wetlands when flow control structures, such as culverts, tidal gates, and bridges need to be replaced in order to improve degraded habitat, water quality, or control of the spread of disease-threatening mosquitoes	8, 9, 10	19, 20
M	Prohibit any mining in sensitive habitats	1, 6, 8, 9	11
M	Consider and incorporate habitat information in any plans to develop artificial reefs; construct artificial reefs with materials that do not adversely impact sensitive habitats	1, 6, 7	11
M	Prohibit mining that alters the sedimentary composition (e.g. sand and gravel) or other important environmental features (e.g. depth) from any area designated as important habitat for demersal species or organisms with demersal life stages	2, 6, 8, 9	11
L	Control invasive species in tidal marshes (e.g., phragmites); modify state wetland regulations to facilitate restoration projects	3	11, 17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	Habitat-Focused Conservation Action	Threat Addressed	Source
M	Develop statewide invasive species management plans that include provisions for inventorying, monitoring, and rapid response; support federal funding for such state plans	3	8
L	Secure additional funding for invasive plant initiatives	3	18
L	Support advanced research and development to explore and implement ballast water treatment methods, other than open-ocean ballast exchange	3	10
M	Regulate the intentional release of live non-native marine organisms, coordinating efforts with adjacent states, the USFWS and the NMFS	3	10
L	Regulate the interstate transport of live marine organisms, coordinating efforts with adjacent states, the USFWS and the NMFS	3	10
L	Develop an early-warning invasions system and mount a strike force (in coordination with USFWS and NMFS) to eradicate new populations of marine introductions	3	10
L	Spend significantly more on training and support for marine systematics and taxonomy to correctly recognize new species introductions	3, 18	10
L	Regulate research projects, biotechnology laboratories, and aquariums to ensure that reared organisms do not escape or are not intentionally released without strict guidelines	3, 19	11
L	Initiate a program to reduce the threat of nuisance / toxic algae and pathogens from spreading spatially and temporally that may impact fishery resources and important habitats	3	11, 23
L	Become engaged in local and regional land use planning at selected landscape-scale sites	1, 20, 21	18
M	Examine finfish species utilization of the Connecticut River estuary with particular emphasis on the endangered shortnose sturgeon and threatened Atlantic sturgeon, tomcod (potential species of concern), as well as dominant species including striped bass and white perch	7	27
L	Monitor the condition of prime shellfish production areas; regulate the harvest of shellfish species from natural beds under state jurisdiction; work with town officials on shellfish law enforcement	5, 10, 12, 14	20
L	Promote Connecticut's commercial and recreational fishing and aquacultural industries consistent with marine productive capacities	5, 14, 17	20
M	Work toward elimination of shellfish closure areas by upgrading water pollution control facilities and reducing non-point sources of pollution	9, 10, 12	20, 24

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	Habitat-Focused Conservation Action	Threat Addressed	Source
L	Continue participation in the Long Island Sound Study and promote the implementation of its recommendations	1, 2, 3, 8, 9, 10, 12, 19, 20	20
M	Establish a nitrogen reduction schedule and targets for all Long Island Sound (LIS) management zones and allocate loads among the individual discharges via permit limit	9, 12	20
H	Enhance existing programs to manage and restore populations of species depressed in abundance, threatened and endangered species	1, 7, 8	23
M	Continue the mapping of eelgrass in LIS to determine trends; continue to promote investigations and research into determining the impacts of nitrogen upon the degradation of aquatic habitats (i.e., loss of eelgrass, increases in macroalgae and benthic algae) in shallow embayments and bays in LIS	1, 5, 9, 12	24
M	Examine the abundance and distribution of benthic macroinvertebrates and evaluate their importance as food source for fish	1, 5, 7	27
M	Inventory and assess the distribution and habitat quality of rocky reef, kelp, sponge, shell, sand wave and eelgrass habitat in LIS and adjacent estuaries	1, 5	27
H	Develop a coordinated strategy to inventory and prioritize coastal habitat restoration and enhancement needs; cooperatively implement restoration programs using all available state and federal resources	1	23

PRIORITY	Species-Focused Conservation Action	Threat Addressed	Source
H	Give priority to management of species identified (by AFS and others) as extraordinarily vulnerable, or at risk of extinction	7	1
M	Monitor bycatch of long-lived species; implement conservation actions (e.g., marine reserves) if population declines are documented	13, 14	1, 7
L	Recognize invertebrate marine species as DPSs in management	7	1
L	Use a more precautionary approach to managing DPSs potentially at risk (e.g., candidate species) by affording protection or remedial action before populations are reduced to the point of being threatened or endangered	7	1, 4

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	Species-Focused Conservation Action	Threat Addressed	Source
H	Give shark and ray research and monitoring high priority due to their slow population growth, and their resulting vulnerability to overfishing and stock collapse	14	2
M	Increase report precision by avoiding lumping several shark and/or ray species together in generic categories in fishery statistics programs; separate species in reporting	7	2
M	Investigate seasonal spawning aggregations of reef species	7, 14	3
M	Coastal sharks: investigate areas for possible pupping locations, examine seasonal presence and abundance of sharks in Long Island Sound	5, 7	27
M	Tomcod/rainbow smelt: inventory stock size and presence by area; determine if reported stock declines are related to chlorinated effluents from sewage treatment plants	7, 9	27
H	Shortnose sturgeon: determine the extent of seasonal usage of the estuary and Long Island Sound. Examine mortality from bycatch in the shad gillnet fishery.		27
H	Investigate whether striped bass are spawning in the Connecticut River; evaluate the ecological implications for the river including displacement of other species and increased predation		27
H	Striped bass: examine implications of expanded coastal stock of striped bass on selected forage species in Connecticut waters		27
H	Menhaden: investigate the location and extent of spawning in Connecticut waters/Long Island Sound. Estimate approximate annual stock size of immature menhaden and determine their ecological significance in the predator biomass they could support		27
H	Inventory fish and lobster spawning grounds throughout Long Island Sound using larval and/or juvenile surveys and assess the relative importance of areas potentially impacted by anthropogenic activities		27
M	Hickory Shad: determine annual abundance, habitat preferences and seasonal movements		27
H	Tautog: determine fidelity of fish to individual sites through tagging and telemetry. Perform independent assessment of fecundity and determine egg deposition rates. Examine egg and larval mortality of discrete areas		27
M	Tautog: determine spawning and over-wintering sites of this resident species and describe associated habitat		27
M	Winter flounder: determine spawning sites and describe associated habitat of this estuarine spawner		27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	Species-Focused Conservation Action	Threat Addressed	Source
M	Atlantic sturgeon: conduct surveys to assess the status of adult stock; collect tissue for stock identification		16
L	Atlantic sturgeon: investigate the feasibility of hatchery culture and stocking to aid recovery		16
H	Examine Atlantic sturgeon prey availability, food habits, distribution, movements and habitat use in Long Island Sound using GIS to overlay existing trawl survey distribution, sediment substrate and bathymetry data with data to be collected on prey availability (bottom grabs), food habits (gastric lavage), and movements (radio or acoustic telemetry, data logging, archival tagging)		27
H	Shortnose sturgeon: conduct baseline population surveys; use radiotagging to provide information on life history, preferred habitats, and movement patterns; monitor changes in habitat quality, population levels, harvest quotas, and reproduction; investigate growth, mortality, movements, food intake, and factors affecting year class strength		16
L	Shortnose sturgeon: evaluate dam removal to restore spawning habitat and historic spawning migration	8	16

PRIORITY	“Other” Conservation Action (including policy and education)	Threat Addressed	Source
H	Identify limiting factors in the abundance, distribution and health living marine resources including fish, birds, invertebrates, reptiles, marine mammals and marine plants	1,4,6,7,8,9,10,12,13,14, 15 (aquaculture), 17,18,21	27
H	Monitor marine fish and invertebrate species abundance, distribution, community and size composition over time and in relation to major habitats to evaluate the effectiveness of fisheries, habitat and water quality management	1,4,6,7,8,9,10,12,13,14, 15 (aquaculture), 17,18,21	27
M	Develop and maintain a geographic information system (GIS) database of marine habitats and living resources	1	27
M	Evaluate the effect of fishing effort restrictions on non-target species considering reductions in bycatch of non-target species, changes in predator-prey dynamics, habitat responses (bottom disturbance, including SAV), changes in food (bait) and structure (trap) availability	13, 14	27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	“Other” Conservation Action (including policy and education)	Threat Addressed	Source
M	Develop an acoustical survey capability to assess schooling fish populations including American shad, Atlantic menhaden, alewives, and Atlantic herring	4, 7	27
M	Evaluate the effect of aquaculture activities on wild fish, invertebrate, bird, reptile and marine mammal resources considering placement of cultch, cages, pens and similar structures as well as mechanical disturbance from hydraulic dredging	14	27
M	Conduct comprehensive ichthyoplankton studies of Connecticut waters	1,9,12	27
M	Integrate ocean resource policies and management regimes, managing fish, habitats, and pollution of the coastal ocean more compatibly with consideration of land-based activities (urban and agricultural)	18, 19, 20, 21	6, 7
L	Use the precautionary, adaptive management approach to management that acknowledges the inherent variation and unpredictability in marine ecosystems; support scientific integration and applied predictions in adaptive management; incorporate science as a key role in marine ecosystem management		1, 2, 4, 6, 7, 8
M	Incorporate broad monitoring programs that directly involve fishers; ecosystem models that describe the trophic interactions and evaluate the ecosystem effects of fishing; and field-scale adaptive management experiments that evaluate the benefits and pitfalls of particular policy measures into ecosystem-based management programs		7
H	Acquire information on predator-prey and competitive interactions to better understand the impact of fishing on natural systems (invest in basic ecological study and monitoring and change perspective from a single-species approach in which maximum sustainable yield is a goal, to acknowledging that fishery production is entirely dependent on functioning ecosystems)	4, 7, 14, 17	7
M	Establish broad monitoring programs that involve fishers and require quantitative information on targeted catch and all forms of bycatch	13	7, 8
M	Develop an inventory of existing species and their historical abundance for each regional marine ecosystem	1,3,7,9,10,14,21	8
M	Support the study of the effects of toxic substances in the marine environment	9, 10	8
M	Investigate the establishment of a network of marine reserves that encompass significant portions of ecosystems and multiple habitats, including both benthic and pelagic components	1, 2, 7, 13, 14, 21	8, 23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	“Other” Conservation Action (including policy and education)	Threat Addressed	Source
M	Control fishing methods or levels of exploitation that are detrimental to the continued viability of populations of marine species	14	22
M	Assist in the enhancement of populations of bivalve shellfish in areas where populations are established, and reestablish populations through seeding projects in areas where there is evidence that populations were once abundant		22
M	Provide logistic support to other Divisions, Bureaus, and Units of the Departments of Environmental Protection and Agriculture, and to other state or federal agencies, which may be involved in pollution abatement and environmental monitoring activities		22
L	Review all applications for permits to conduct regulated activities in LIS; upon review of any activity determined to result in an adverse impact upon marine or estuarine fishery resources, prey species, or habitat – or any other adverse impact upon the environment – recommend denial of the permit and provide justification for this recommendation to the appropriate agency		22
M	Obtain information on catch, effort, area fished, and port of landing from all commercial and recreational fisheries at a level of detail that will allow DEP fisheries scientists to estimate the relative condition of stocks of fishery resource species		22
M	Improve the level of coordinated data transfer and information processing		22
M	Conduct resource monitoring programs independent from the biases associated with commercial and recreational fisheries for the most important and most heavily exploited of the marine and estuarine species inhabiting the Sound		22
H	Conduct research on the biology and population dynamics of resident and migratory marine and estuarine species, and on the general ecology of Long Island Sound		22
L	Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic habitat	19	20, 23
M	Develop an outreach and public awareness campaign focusing on prevention of bioinvasions, educating the public about the harm they can cause	3, 19	10, 11, 19, 24

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

PRIORITY	“Other” Conservation Action (including policy and education)	Threat Addressed	Source
M	Continue education efforts on the hazards of marine debris to certain marine life and habitats	9, 19	11
M	Promote an understanding and appreciation of LIS as a regional ecosystem and a national treasure	19	23
M	Increase the availability of information derived from marine fisheries research and management projects	19	22
M	Encourage more selective fishing gear and practices which efficiently harvest target species and sizes without negatively impacting non-target species and sizes	7, 13, 14	13

**MAMMALS: Compilation of Conservation Actions for Connecticut
from Existing Management Plans and Literature**

Source Codes:

- 1 = Bat Conservation International (2001): Bats in Eastern Woodlands
- 2 = North American Bat Conservation Partnership: NABCP Strategic Plan
- 3 = USFWS (1999): Indiana Bat (*Myotis sodalis*) Recovery Plan
- 4 = NEES&WDTC (draft): Allegheny woodrat (*Neotoma magister*)
- 5 = NEES&WDTC (draft): Appalachian cottontail (*Sylvilagus obscurus*)
- 6 = NEES&WDTC (draft): Eastern big-eared bat or Rafinesque's big-eared bat (*Corynorhinus rafinesquii*, formerly *Plecotus rafinesquii*)
- 7 = NEES&WDTC (draft): Eastern red bat (*Lasiurus borealis*)
- 8 = NEES&WDTC (draft): Eastern small-footed bat (*Myotis leibii*)
- 9 = NEES&WDTC (draft): Harbor porpoise (*Phocoena phocoena*)
- 10 = NEES&WDTC (draft): Hoary bat (*Lasiurus cinereus*)
- 11 = NEES&WDTC (draft): Least shrew (*Cryptotis parva*)
- 12 = NEES&WDTC (draft): Lynx (*Lynx canadensis*)
- 13 = NEES&WDTC (draft): New England cottontail (*Sylvilagus transitionalis*)
- 14 = NEES&WDTC (draft): Northern bog lemming (*Synaptomys borealis sphagnicola*)
- 15 = NEES&WDTC (draft): Silver-haired bat (*Lasionycteris noctivagans*)
- 16 = NEES&WDTC (draft): Southeastern myotis (*Myotis austroriparius*)
- 17 = NEES&WDTC (draft): Southern rock vole (*Microtus chrotorrhinus carolinensis*)

- 19 = Woodley (1995): Addressing Incidental Mortalities of Harbor Porpoise (*Phocoena phocoena*) in Groundfish Gillnet Fisheries of Atlantic Canada: [International Marine Mammal Association](#)
- 20 = Woodley (1993): Potential Effects of Driftnet Fisheries for Albacore Tuna (*Thunnus alalunga*) on Populations of Striped (*Stenella coeruleoalba*) and Common (*Delphinus delphis*) Dolphin
- 21 = Pew Oceans Commission: Dayton et al. (2002) Ecological Effects of Fishing
- 22 = The Nature Conservancy (comment letter of October 27, 2003)
- 23 = CT DEP Staff - CWCS Planning Process Input/Survey Response
- 24 = TNC (1999): North Atlantic Coast Ecoregional Conservation Plan

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

25 = TNC (2003): Lower New England – Northern Piedmont Ecoregional Conservation Plan

26 = CT OPM (1998): Conservation and Development Policies Plan for Connecticut, 1998-2003

Threat Addressed by Conservation Action Codes:

- 1 = Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction projects, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)
- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in long island sound and estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)
- 20 = Unplanned urban development and growth (inability to control or influence private land development under local jurisdiction, lack of information to municipalities, lack of landowner incentives, population growth, changing economy, etc.)
- 21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Caves and mines that provide internal temperatures suitable for bats are uncommon and must be protected from human disturbance and actions that alter their internal microclimates.	1, 5	1
Protection of riparian habitat is especially important to bats by providing drinking water and high-quality roosting and foraging habitat in close proximity.	1, 2	1
Use management practices that create small forest openings to foster the development of suitable foraging habitat and enhance roosting habitat as well. Smaller harvest areas increase edge habitat per unit area, promoting plant and insect abundance and diversity beneficial to bats and other wildlife as long as areas of mature forest are maintained for roosting and foraging.	1, 2	1
To protect bats when planning timber management: Preserve roost trees (or those likely to provide roosts) within cut blocks, including some younger trees for future roosts; Leave small groups of trees around preserved roost trees to prevent blowdown or climatic influences on roosts; Leave roost trees close to the edge of cut blocks to minimize travel distance to shelter; Provide forested travel corridors that connect remnant patches of mature forest as routes of travel that provide increased protection from predators	1, 2, 16	1
Develop timber management prescriptions that strive to create bat roosting habitat consisting of mixed hardwood forests with 60 to 80 percent canopy closure containing 38 or more 22 to 41 cm dbh potential roost trees/ha (including 14 snags/ha greater than 23 cm dbh).	1, 2, 16	1
Develop bat foraging habitat consisting of mixed hardwood forests with 50 to 70 percent canopy closure with less than 35 percent understory cover having 5 to 12 cm dbh. Cut type, cut size, temporal factors (such as logging restrictions during Indiana myotis maternity season, March 31 to August 31), leave tree marking (trees to be left for wildlife are marked), and cut tree marking (trees to be harvested are marked) to avoid incidental take and improve roosting and foraging habitat.	1, 2, 16	1
In landscapes managed intensively for timber, maintain snags in streamside management zones, the habitat matrix separating managed stands, forested corridors, and other less intensively managed habitats. Residual trees, snags, and stumps, can still be provided within short-rotation, even-aged stands, but not at densities as great as can be provided in the habitats described above. Due to the inherent danger of operating machinery around fall-prone trees, OSHA guidelines regarding where snag may be retained must be incorporated into any snag maintenance and protection program.	1, 2, 16	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
<p>Use the following steps for selecting, retaining, and recruiting snags and dead woody material: 1. During logging operations, leave as many dead, damaged, and dying trees and defective (cull) live trees as possible, and as safety and silvicultural objectives permit. 2. Place emphasis on larger diameter snags because they generally remain standing and retain bark longer, and support a larger variety of wildlife. 3. Maintain throughout the forest large snags or defective (cull) trees at various stages of deterioration. 4. Where possible, maintain well-distributed, variable-sized patches of mature and old-growth forest through extended harvest rotations. 5. Select groups of live trees and snags in clear-cut units, such as one clump of 15 averaging over 23 cm dbh per 2 ha. 6. Leave high tree stumps where possible. 7. Retain less-decayed snags in favor of more-decayed snags, large diameter snags in favor of small diameter snags, tall snags in favor of short snags, and snags with greater bark cover in favor of snags with little bark cover. 8. Manage roads used by fuel wood-cutters, or restrict wood-cutting to down materials or smaller diameter snags, and emphasize snag retention downslope from road systems to protect snags from firewood cutting. 9. Leave as many hardwoods as possible that have natural cavities or cavities excavated by woodpeckers. 10. Utilize protective measures (fire trails, machine piling, or fire retardant) where necessary when burning slash (limbs and treetops) to retain snags selected for wildlife habitat. 11. Consider topping or girdling some large defective (cull) trees to create snags. 12. Establish a monitoring program to evaluate whether management objectives for cavity-using wildlife species are being met.</p>	1, 2, 16	1
<p>Because of the ephemeral nature of snags, stumps, and logs, forests should be managed to maintain consistent roost availability over time. Bat roost cavities and crevices in both snags and live trees have been successfully created using chainsaws, and snag creation projects have created habitat for other secondary cavity-nesting wildlife</p>	1, 2, 16	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
<p>Use fire to create habitat diversity and edge to increase habitat and wildlife diversity. Prescribed burns can be used to create snags, but existing snags may also be lost. While fire should continue to be an important management tool, it is important to note that due to liability, air quality, impacts on soil suitability, burgeoning suburban and rural populations, and other concerns, prescribed fire may not always be feasible. For this reason, other management practices that might be used in combination with fire, or to replace the role of fire, such as timber harvest, mechanical thinning, and herbicides, should be investigated, and their effects on bat habitat evaluated.</p>	1, 2, 16	1
<p>Use pre-burn surveys to establish information on bat species found in the area and to identify their roost locations, then develop management guidelines that protect bats and enhance their habitat. Use no-burn buffer zones greater than 61 m around occupied caves, crevices or trees (live or dead); ensure that smoke drifts do not reach summer and winter roost areas during prescribed fires; use no-disturbance buffer areas of 0.4 km for known roost trees and 3.2 km no-disturbance buffers all maternity roosts.</p>	1, 2, 16	1
<p>Although prescribed burning is one of the several activities allowed to occur within the no-disturbance zone, evaluate each proposed activity to determine the direct, indirect and cumulative effects on the bats. Prescribed burning, to be conducted, whenever possible, during the winter and early spring when Indiana myotis are hibernating, can maintain foraging habitat and flight corridors in upland and riparian areas potentially used by bats in the summer.</p>	1, 2, 16	1
<p>Use group and single tree selection and other multi-age silvicultural systems that leave considerable forest structural components on site to help retain the area's suitability as wildlife habitat in some riparian areas</p>	1, 2, 16	1
<p>Evaluate the effects of various widths, lengths, and vegetation composition of leave strips or buffers before waterway management practices can be designed that will fully consider bat needs.</p>	1, 2, 16	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Implement waterway management to include streamside management zones (SMZs) that designate filter strips, protect roosts, establish harvest timing restrictions, prescribe selective timber management, protect drinking water sources, and develop additional sources of available water. Maintain SMZs at a minimum of 15.2 m wide along each side of perennial and intermittent streams to reduce the likelihood of sediment and debris reaching the water; maintain a buffer zone of at least 50 percent canopy closure for 30.5 m on each side of perennial streams in riparian zones.	1, 2, 8, 9	1
Potential foraging streams for endangered bats should be identified and buffered by a continuous corridor of trees at least one canopy-width wide; provide a stand of mixed hardwoods 30.5 m from each stream bank; prohibit the removal of dead or dying trees with exfoliating bark within 30.5 m of all potential foraging streams; and eliminate timber cutting in permanent stream riparian zones during the period of 1 May through 1 October	1, 2, 8, 9	1
Create drinking water sources where no reliable sources of drinking water exist. Up to four water sources per 65 ha may be developed in the absence of free-flowing water; provide sources of upland or ridge top ponds at about 0.8 km intervals; and eliminate contaminated water sources.	1, 2, 8, 9	1
Protection of important roosts in geologic features is vital for conserving bat populations. Bat diversity and abundance are strongly correlated with the diversity of available roosting and feeding habitats and their proximity to each other and to drinkable water. Roost shortage is correlated with a paucity of bat species	1, 2, 5	1
Proper management and conservation of habitat near cave and mine roosts is essential. Avoid activities that may alter the environment of caves or mines, such as entrance or passage modification. Carefully manage habitat surrounding important caves, mines, or cliffs, which may include an entire watershed to avoid negative impacts	1, 2, 5	1
Proper management, conservation, and where necessary, restoration of historically important caves and mines is critical to recovery of threatened and endangered bat species.	1, 2, 5	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Management policies for protecting geologic features primarily rely on buffer zones to control habitat manipulation around cave entrances, sinkholes, and near cliff lines, including: protect caves from damaging surface activities such as siltation, deposition of materials, and placement of roads; prohibit ground-disturbing activities and tree harvesting within a 60 m radius around cave entrances; protect the entrance microclimate, humidity, water flow and quality, temperature, airflow, soil pH, and sedimentation; prohibit timber harvesting activities within sinkholes, near cliff lines, and within 10 m of cave entrances.	1, 2, 5	1
Protect geologic features used by sensitive bat species through the use of buffer zones, activity timing restrictions, land acquisition, and controlling human disturbance to roosts including: develop primary and secondary management areas of approximately 0.8 km and 2.4 km respectively, to avoid disturbance to hibernation roosts; restrict access within 30 m of any cave found to contain wintering Indiana myotis; discourage or prohibit (where possible) access in caves occupied by Indiana myotis in the summer between 15 March and 31 October, and in the winter between 1 September and 30 April; use cave and mine gates to prevent human disturbance within sensitive roosts; use annual monitoring programs to evaluate the effectiveness of bat gates	1, 2, 5	1
Concrete bridges with vertical crevices approximately 2 cm wide by at least 30 cm deep provide ideal roosts and sometimes accommodate very large, regionally important bat colonies. The best roosts are in bridges that are 3 m or more above ground and heated by the sun. Although only about 1 percent of bridges and large culverts currently meet bat needs, those that do often accommodate large bat colonies. Bridge and culvert modifications can create excellent roosting habitat for large numbers of bats, and can be incorporated during original construction at little or no extra cost. Bridges and large culverts that do not meet bat needs can be easily retrofitted for bats at little cost.	1, 2, 5	1
Artificial crevices are often easy to create and can provide roosting habitat in a wide variety of locations where natural crevices are lacking. Nursery colonies frequently live in the spaces created when signs are attached to buildings and also have been attracted to spaces behind corrugated metal predator guards attached to trees to protect wood duck nest boxes; molded "bat bark" has been successfully tested as a substitute for exfoliating bark	1, 2, 5	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
In cases where bats become a nuisance by roosting in an inappropriate location, it is often possible to exclude them to alternative roosts without harm, as long as this is not done in May through August, when flightless young would die. Locate the alternative roost (or roosts) as near as feasible (ideally within a meter, normally less than 90 m), and as far in advance of eviction as possible; Identify exit points used by the colony by observing the bats during the active season. In fall, begin excluding the colony by placing one-way valves (such as loosely hanging plastic flaps) over major exit holes, and sealing all other potential roost access points; Following the exclusion, inspect the roost to ensure all bats have left. Then seal all remaining access holes.	19, 20	1
Provide bat houses to accommodate bats displaced from building demolition.	19, 20	1
Although artificial roosts should not be viewed as a substitute for good habitat management, they can provide crucial alternatives during habitat recovery when natural roosts are sparse.	19, 20	1
Monitor bat roosts for contamination and take following measures if bats are suspected to have been exposed to toxic substances: Survey roosts to detect unusual mortality; Collect a guano sample from which levels of organochlorines, metals, and synthetic pyrethroids (but not organophosphates or carbamates) can be measured; Collect any dead or dying bats for possible future chemical analysis based on results of the guano analysis; Wrap both types of samples, guano or bats, in aluminum foil, put in a lock-type plastic bag, and store in a freezer; Contact the local U.S. Fish and Wildlife Service office and ask for the phone number of the nearest contaminant specialist (located in every state). This person can give instructions concerning the further handling and shipping of samples and can provide a minimum number of sample analyses and interpretation.	7, 9	1
Chemicals that are known to be toxic to bats or that may negatively alter insect abundance should not be applied near bat roosts, especially large cave colonies. Pesticide and herbicide applications should be avoided in areas heavily used by foraging bats.	9	1
Identify bat caves and other sensitive areas with ground inspections or related management actions to take place as part of a site-specific analysis required for Environmental Impact Statement for Gypsy Moth Management in the U.S.	9	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
<p>Identify key resources: Survey caves, mines, and other potential locations of key roosts to determine past and present significance to bats, examining each for both evidence and suitability of use. Inventory such locations and initiate protection and long-term status trend monitoring. In some cases, recently decommissioned mines can be recognized as having ideal habitat potential even though they have not previously supported bats. Identify key drinking and foraging habitats. Identify flyways used nightly and during migration. Prepare and share guidelines for recognizing currently unoccupied, but potentially key bat roost resources.</p>	1, 7	2
<p>Describe, quantify, and monitor the effects of current land-management practices and other human disturbances on bats: Describe and quantify the anthropogenic impacts on bats resulting from land management practices. Conduct implementation and effectiveness monitoring of soil and watershed, range, timber, mining, and other ground-distributing actions with potential impacts on bats, and provide feedback to land managers. Develop standards and guidelines to mitigate or ameliorate impacts. Determine the effects on bats of environmental contaminants, including unregulated dumping, the use of pesticides and herbicides, cyanide-leaching ponds, and other water quality issues. For pesticides, identify the kinds of chemicals used and timing of application. Assess behavioral and physiological impacts to bat individuals and populations resulting from pollutants. Evaluate the effectiveness of land management actions where the impacts on bats have been considered.</p>	1, 6, 7	2
<p>Develop management standards and guidelines for bats, including them in existing management plans for other wildlife and associated habitat: Develop management standards, guidelines, and habitat goals for bats and ensure that they are incorporated into federal, provincial, and state land management and wildlife conservation plans. Standardize database information schemes to ensure compatibility and facilitate sharing between organizations and agencies. Standardize permits, qualifications, and protocols for bat research and conservation activities.</p>	1, 7, 21	3
<p>Identify, protect, and enhance key roosting, feeding, and drinking resources for bats: Identify all important natural and artificial roosts and prioritize for protection the sites that contain the largest or most diverse populations and the most threatened or endangered species. Cave and mine roosts can be categorized according to 1) total numbers of bats accommodated (either past or present), 2) number of species sheltered, 3) apparent value of the site in meeting bat needs, 4) long-term safety of the site, if protected, 5) known threats if not protected, and 6) status of the species involved. One early goal is to protect 90 percent of sites known to shelter hibernation populations or nursery colonies that rank within the largest 10 percent known for each of an area's most vulnerable species.</p>	1, 2, 7	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Establish artificial roosts in areas where the loss of natural roosts now limits population recovery. Incorporate artificial roosts, where feasible, in new construction projects, and evaluate the usefulness of artificial bark as roosting habitat in forested areas where snag habitat is lacking.	1, 2, 5	3
Identify, protect, restore, maintain, and monitor key bat flight and migratory corridors.	1, 2, 7	3
Address threat of bycatch as a major factor contributing to the significant decline of many marine mammal populations. Of the 145 marine mammal populations in U.S. waters, 44 populations (30 percent) either suffer high rates of bycatch or are at risk of extinction. Thirteen of the 44 (30 percent), caught primarily in coastal gill-net fisheries and to a lesser extent in offshore drift gill-net fisheries, currently suffer bycatch mortality that exceeds sustainable levels	1, 13, 14	21
The DEP and TNC, in collaboration with other groups, work together to make the application of prescribed fire for ecological restoration more common on lands owned by the DEP and TNC as well as other conservation lands. The first step in this effort would be to identify existing barriers to prescribed fire.	1, 2, 21	22
Invasives are a key threat to many rare plants and natural communities. The DEP and TNC could enhance their current work to control existing invasive plants and to prevent new invasions. This could include continuing to implement and monitor the phragmites control projects at Lord Cove and Lieutenant River and working with partners on identifying and implementing an overall phragmites control and periodic maintenance strategy for the Lower Connecticut River as a whole.	3, 21	22
Protect and restore remaining natural wetlands	1	20
Minimize impacts from residential development by clustering homes together, maximizing forest patch size, minimizing fragmentation, and maximizing connectivity; site roads and utility corridors to reduce fragmentation and landscape with native vegetation where possible	1, 2, 20	20
Control invasive species in tidal marshes (e.g., phragmites)	3	22
Develop municipally-based strategies to manage wastewater treatment systems, develop yard waste composting sites and be involved in the Phase II planning process to ensure best management practices for municipal maintenance of streets, catch basins, and storm water management	8, 9, 20	22
Collaborate with The Nature Conservancy to better define the threats resulting from atmospheric deposition and determine what should be done to abate them	9	22
Preserve 10 coastal plain pond habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 coastal pine barren habitats of 1,000-3,000 acres each in eco-subregion	1	24

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Preserve 10 maritime grassland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 5 maritime dune/bluff habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 brackish tidal wetland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 fresh tidal wetland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 5 saline tidal wetland habitats of 100-500 acres each in eco-subregion	1	24
Continue to seek public and private capital for land acquisition	1, 20	24
Become engaged in local and regional land use planning at selected landscape-scale sites	1, 20, 21	24
Secure additional funding for invasive plant initiatives	3	24
Ensure the continued existence of the eleven matrix forest communities (in the Lower New England - Northern Piedmont ecoregion) and restore natural processes to promote development of mixed-aged stands	1, 2	25
Conserve multiple viable occurrences of all aquatic community types and restore hydrologic processes to promote healthy, functioning aquatic ecosystems	1, 2, 8, 9	25
Promote best available control methods to nonpoint pollution sources including sludge and industrial waste disposal; highway, urban, silvicultural and agricultural runoff; and erosion from construction sites	9, 15, 20	26
Encourage the use of soil and water conservation practices to retain agricultural productivity and to lessen the on-site and off-site impacts of erosion, sedimentation, and animal wastes	9, 15	26
Encourage the use of less toxic pesticides and herbicides and Integrated Pest Management practices where appropriate	9, 15	26
Restore tidal flows to coves, embayments, tidal rivers, and tidal wetlands when flow control structures, such as culverts, tidal gates, and bridges need to be replaced in order to improve degraded habitat, water quality, or control of the spread of disease-threatening mosquitoes	8, 9, 10	26
Monitor current mitigation projects to determine whether wetland functions are being properly replaced; improve mitigation planning accordingly; define buffer areas adequate to protect wetlands and associated resources	1, 2, 8, 9, 20	26
Seek to achieve no net loss of wetland resources through development planning that avoids wetlands whenever possible, minimizes intrusion when it cannot be avoided, and mitigates unavoidable impacts through wetland enhancement or creation	1, 2, 5, 21	26
Evaluate the effect of aquaculture activities on marine mammal resources considering placement of cultch, cages, pens and similar structures as well as mechanical disturbance from hydraulic dredging.	14	23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Indiana myotis – 1. Retain as many snags as possible within at least 2.4 km of a hibernation site. 2. Use forest management techniques (e.g., girdling, topping, fungal inoculation) that ensure future snag availability at a density greater than or equal to what currently exists within 2.4 km. 3. Revegetate areas impacted by human activities within at least 2.4 km of a hibernation site, using tree species documented as roost trees (e.g., oaks, hickories, and maples). 4. Revegetate non-forested areas (e.g., abandoned agricultural lands, abandoned mine lands, etc.) within at least 2.4 km of a hibernation site, using tree species documented as Indiana myotis roost trees. 5. Maintain sufficient vegetational diversity and structural complexity to support prey items, especially nocturnal lepidopterans.	1, 2, 7	1
Indiana myotis: Avoid removal of trees known to be used. If removal is unavoidable, conduct during the non-maternity season (between September 15 and April 15) to avoid direct killing	1, 2, 7	1
Indiana myotis: Retain all dead trees of all species at least 23 cm dbh within 30.5 m of intermittent streams and 61 m of permanent streams; recruit snags by leaving selected trees such as black oak or scarlet oak to die over a period of years; protect both live trees and snags within 3.2 km buffer zones around trees used as maternity roosts.	1, 2, 7	1
Indiana myotis: Use monitoring programs to gather information on the use of snags; annually monitor cavity trees and known roosts; use the information obtained from these monitoring programs to improve existing land management plans.	1, 2, 7	1
Indiana myotis: Design selective cutting practices to increase vegetative diversity and retain hardwood tree species with bark characteristics suitable for use as roosts, including shagbark hickory, shellbark hickory, bitternut hickory, green ash, shortleaf pine, eastern cottonwood, post oak, white oak, northern red oak, slippery elm, American elm, black locust, and silver maple.	1, 2, 7, 16	1
Indiana myotis: Designate filter (buffer) strips within 61 m on either side of perennial streams and within 30.5 m on either side of intermittent streams; protect upland water sources that are of real or potential value in conjunction with timber sales; manage both human-made and natural ridge-top ponds on a case-by-case basis, with buffer zones, corridor retention, and other management methods; allow road ruts to remain where they do not compromise the quality of surrounding soil and water.	1, 2, 7, 8, 16	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Indiana myotis: Seasonal surveys are essential for identifying and prioritizing roost sites for protection. Ideal roosts, even when no longer occupied, should receive the highest protection priority for successful conservation. Cliff faces, rock shelters, and talus slopes often provide essential roosts that should be identified and protected during land alterations. Seasonal surveys to detect bats, their droppings, or roost stains from past use, are essential to identify and prioritize the protection of important caves and mines.	1, 2, 7	1
Indiana myotis: Monitoring actions include regular inspection and repair of cave gates and signs, biannual population censusing, monitoring of human disturbance, regularly tracking and measuring cave microclimate parameters, identifying potential staging areas, and monitoring summer habitat use. Also monitor published literature and research project reports from Indiana studies.	1, 2, 5, 7	1
Indiana myotis: Assign a 91.5 m buffer for aerial applications and a 18.3 m buffer for ground applications to habitat when using the herbicides 2,4-D, 2,4 DP, triclopyr, and any formula containing kerosene or diesel oil.	9, 15, 16	1
Indiana myotis: Restrict timber management activities around roosts, such as caves, mines, and other geologic features used for hibernation or rearing of young	5, 16	1
Indiana myotis: Limit annual harvests of potential habitat (hardwood stands) to no more than 0.2 to 0.7percent annually or no more than 3.5 percent in 5 years.	16	1
Indiana myotis: Research the ecology and life history. Document potential impacts of changes in temperature and humidity profiles on hibernating bats. Determine the demographic structure of the population (age and sex ratios). Determine and monitor reproductive success, including recruitment of young into the population. Determine and monitor survival of adults and young. Determine and monitor movements among caves. Determine the significance of swarming sites to the survival of the species. Determine the food habits and foraging behavior of the Indiana bat, including sex specific foraging behavior and prey selection. Conduct population viability analyses on populations and subpopulations of the Indiana bat. Determine if Indiana bats use night roosts and, if so, determine whether night roosts differ in structure or habitat from day roosts.	1, 2, 7	3
Indiana myotis: Research the genetics. Determine associations of summer range with hibernacula. Determine subpopulations via genetics.	1, 2, 7	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Indiana myotis: Research the summer habitat. Determine if there are regional differences in roosting or foraging habitat for maternity colonies and males. Further delineate the range. Use Forest Inventory Data, LANDSAT imagery, aerial photography, or other sources to assess extent and condition of Indiana bat summer habitat. Determine summer habitat trends. Evaluate, refine, and validate HSI model. Evaluate the use of bat detectors for determining the presence and habitat use of Indiana bats.	1, 2, 7	3
Indiana myotis: Determine if chemicals are contaminating them. Determine concentrations of organic and inorganic contaminants in Indiana bats, their food, and habitats. Determine the effects of contaminants on survival and reproduction	9	3
Indiana myotis: Determine effects of cave modifications, especially currently used gates, on airflow and temperature.	2, 5	3
Indiana myotis: Monitor the status of populations in hibernacula. Monitor the status of populations in summer. Maintain and update distribution records of known maternity colonies. Identify and monitor maternity colonies. Reestablish a central banding authority.	1, 2, 7	3
Indiana myotis: Restore abandoned hibernation caves. Eliminate disturbance at historic caves. Restore hibernating microclimate.	2, 5	3
Indiana myotis - Protect during hibernation. Prevent unauthorized entry by humans. Erect warning signs. Erect barriers - Gate or fence cave. Patrol caves. Deter human access in vicinity of hibernacula. Minimize disturbance due to monitoring and research activities. Survey populations every two years. Protect hibernacula. Work with private landowners. Purchase or lease hibernacula to assure long-term protection. Protect the integrity of hibernacula systems. Protect the surface surrounding hibernacula. Protect the physical characteristics of hibernacula. Make locations of hibernacula available to appropriate Federal offices, state wildlife agencies, and non-governmental organizations (NGOs). Identify new Indiana bat winter roost sites.	1, 2, 6, 7, 17	3
Indiana myotis - Provide maternity roosts. Assess habitat using a Habitat Suitability Index model developed for the species. Determine presence/absence via mist netting or trapping.	1, 2, 7	3
Indiana myotis - Promote awareness of their needs. Provide outreach to private landowners. Prepare and distribute pamphlets. Prepare and present slide programs. Assist rangers and naturalists in the development of presentations. Provide outreach to government officials.	19	3
Indiana myotis - Communicate with land managers and researchers to support recovery efforts. Encourage and support the publication of research, management, and other recovery related information.	19, 21	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northern long-eared myotis - assign a 91.5 m buffer for aerial applications and a 18.3 m buffer for ground applications to habitat when using the herbicides 2,4-D	9, 15, 16	1
Bats - Surveys and censuses need to be conducted to establish distribution and abundance data in the Northeast. Long-term monitoring of known populations should be initiated to provide baseline data on demographics, and shed light on what the minimal habitat requirements are for this species. Use of radiotelemetry and tracking can be an effective way to uncover unknown roosts.	1, 2, 7	6
Bats - Protection of potential habitat and use of forest management practices that promote mature floodplain forests containing hollow trees are critical management practices for this bat. The natural sites where these bats occur are in short supply (old trees with large cavities) or are compromised by disturbance or alteration (caves). As a result, man-made roosts, which also are subject to disturbance and loss, become even more important. Protection of known roosts and possible roost sites from disturbance is needed, this being probably the most important conservation issue.	1, 2, 7, 8, 17	6
Bats - More accurate information should be collected on the general biology, foraging habitat, foraging behavior, and the general ecology of the species in order to generate management guidelines. Foraging habitat requirements (area, vegetation density, community structure), need to be identified. Buffer zones around foraging areas should be established and water quality should be monitored within these areas. Flight paths or flight corridors also are areas that need extensive research. Radiotelemetry efforts would enhance the mapping of flight paths used by the bats, and reveal foraging areas.	1, 2, 7	6
Eastern red bat - Information is needed on the life history, seasonal distribution, and habitat use/requirements of this species in the Northeast. Sampling techniques need to be improved, and regional, targeted surveys initiated for this species in order to gather quantitative data for management decisions. Research is needed to develop a better Anabat library for tree bats in the Northeast, and the correlation between mist-net capture and call frequency should be examined. Currently, a bat survey and telemetry project has been launched in Connecticut to identify roost locations and habitat requirements in order to produce specific management guidelines for each species. Consideration should be given to the expansion of this statewide project into a coordinated regional effort designed to gather baseline data (i.e., data on habitat requirements, populations, and demographics) on eastern red bats and other bat species of conservation concern.	1, 2, 7, 21	7
Eastern red bat - Specific research should be directed toward reducing mortality resulting from collisions with communication towers and vehicles on highways.	11	7

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Eastern red bat - This species' use of leaf litter in hibernacula should be investigated and the information integrated into controlled burning regulations and practices.	1, 2	7
Eastern red bat - Caves and mines where this species exists in significant numbers should be protected during the vulnerable hibernation period from November through March. If necessary, gating should be erected at cave entrances and/or warning/interpretive signs used to deter entrance to these sensitive sites. Restricting access to hibernacula at this time is the best way to ensure the continued existence of this species.	8, 17	8
Eastern red bat - Suitable habitat around hibernacula should be protected in order to prevent adverse changes in cave temperature, humidity, and air or water flow. Buffer areas around and above hibernacula and roosts, to shield bats from disturbance, should be incorporated into management plans.	1, 2, 7	8
Eastern red bat - Targeted summer surveys should be initiated to gain more knowledge about summer life history. Foraging areas (streams and ponds) must be identified and protected. Research into the effects of pesticides and other contaminants on bats as well as their prey base is needed. Baseline information on population status and trends, including reproductive status, recruitment, and mortality is needed before intelligent management decisions can be made.	1, 2, 7	8
Eastern red bat - Surveys for the presence of this bat should continue at cave entrances (April-October). Monitoring of hibernacula should include the placement of data loggers in order to gather much needed data on microhabitat requirements. Management recommendations currently focus on protection of caves and roosts. Land managers should expand protection efforts to incorporate all habitat requirements.	1, 2, 7	8
Eastern small-footed myotis- assign a 91.5 m buffer for aerial applications and a 18.3 m buffer for ground applications to habitat when using the herbicides 2,4-D	9, 15, 16	1
Silver-haired bat - Information is needed on the life history, seasonal distribution, and habitat use/requirements of this species in the Northeast. Sampling techniques need to be improved, and regional, targeted surveys initiated for this species in order to gather quantitative data for management decisions. Research is needed to develop a better Anabat library for tree bats in the Northeast, and the correlation between mist-net capture and call frequency should be examined. Currently, a bat survey and telemetry project has been launched in Connecticut to identify roost locations and habitat requirements in order to produce specific management guidelines for each species. Consideration should be given to the expansion of this statewide project into a coordinated regional effort designed to gather baseline data (i.e., data on habitat requirements, populations, and demographics) on silver-haired bats and other bat species of conservation concern.	1, 2, 7	15

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Silver-haired bat - Research also is needed to understand the role this species plays in the transmission of rabies to humans.	10, 19	15
Hoary bat - Reproductive ecology is limited on this species. Information is also needed on migratory flyways, population trends, and hibernation requirements. Sampling techniques need to be improved, and regional, targeted surveys initiated for this species in order to gather quantitative data for management decisions. Research is needed to develop a better Anabat library for tree bats in the Northeast, and the correlation between mist-net capture and call frequency should be examined. Currently, a bat survey and telemetry project has been launched in Connecticut to identify roost locations and habitat requirements in order to produce specific management guidelines for each species. Consideration should be given to the expansion of this statewide project into a coordinated regional effort designed to gather baseline data (i.e., data on habitat requirements, populations, and demographics) on hoary bats and other bat species of conservation concern	1, 2, 7	10
North American Bat species - Establish and monitor bat numbers and species composition using reliable, reproducible techniques. Develop and evaluate new population-monitoring techniques. Identify potential threats and monitor impacts to populations. Identify and define population units relevant for conservation planning and research. Conduct research to improve the accuracy and ease of species identification.	1, 2, 7	2
North American Bat species – Identify species requirements for nursery and hibernation roosts. Priority should be given to species identified as the most vulnerable and threatened. Conduct research to better understand how, when, and why bats use, vacate and switch roosts. Identify species requirements for foraging habitat and water sources. Compare requirements in contrasting areas to better understand the geographically varying needs of species with wide distributions. Determine requirements for transitory roosts and identify habitats used for foraging during migration. Estimate carrying capacities of habitats, based on current and restorable habitat conditions. Identify methods for measuring habitat use.	1, 2, 7	2
North American bat species - Refine and standardize methods and protocols for determining and plotting species distributions continent-wide. Collect data on seasonal distribution changes according to altitude, habitat, and geography during field inventories. Standardize data collection and reporting methods.	1, 2, 7	3
Allegheny woodrat – Document detailed life history characteristics as well as movement patterns, habitat requirements, and mortality factors. To fully understand the basic ecology of the Allegheny woodrat, including preferred food sources, home range size, specific habitat requirements, and other limiting factors, more research will be required.	1, 2, 7	4

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Allegheny woodrat - The disputed question of whether or not the species ever occurred in Connecticut should be resolved. The record is unclear whether or not the species ever occurred in the state, since no documented specimens exist and there is some question about the capture locations.	21	4
Allegheny woodrat – Research the link between raccoons and Baylisascaris procyonis. Protect known sites with Allegheny woodrat populations from habitat change, especially residential development, which encourages increased raccoon populations. Protection of known populations should be enforced, specifically from human disturbances. Ledges, cliffs, rock crevices, boulder sites, or caves that woodrats may inhabit should be “closed” to the public (especially if they occur on state grounds).	10, 20	4
Appalachian cottontail - Provide adequate dense cover at higher elevations, especially heaths, the predominant understory vegetation preferred. Land managers should incorporate methods such as prescribed burns, clearcuts, thinning, and other techniques that promote edges and dense cover to manage for this species. Mixed-oak forest or patches of recent clearcuts (6-7 years of age) maintained by periodic fires, adjacent to deciduous growth, provide excellent habitat characteristics. Maintaining large blocks of forest with a thick understory can provide refuges and may give a competitive edge to this species.	1, 2, 7	5
Appalachian cottontail - Sustained support should be maintained for programs of research related to the biology and ecology of cottontails in relation to their environments.	1, 2, 7	5
Least shrew - Surveys need to be intensified for this species at the northern edge of its range. Distribution information is sparse, outdated, or lacking for some areas in the Northeast, especially New York and Connecticut. Existing populations, and those found in future survey efforts, need to be protected.	1, 2, 7	11
Least shrew - A regional landscape approach should be employed to prevent further fragmentation of areas in which this species is historically known to occur in New Jersey, Pennsylvania, New York, and Connecticut. The least shrew would benefit from coordinated management efforts focused on grassland or old-field and edge species, including small game species with similar habitat requirements.	21	11
New England cottontail - The presence of large patches (>10 ha.) is critical to the survival of local metapopulations, and such areas of habitat will become increasingly rare if current land-use trends continue. Bushy patches at the edges of wetlands or other forest openings, and thickets within regeneration stands, provide good cover for the species. Protection of these sites can be achieved through conservation easements on private lands and restriction of development through local and town planning efforts.	1, 2, 16, 19	13

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
New England cottontail - Management procedures should encourage the maintenance of adequate parcels of shrubby, early successional areas. Increasing understory stem density may be the most effective approach for improving escape cover for this species.	1, 2	13
New England cottontail - There is a definite need to educate the public about the value of early successional habitats, not only for this species, but for other species of conservation concern linked to this habitat type.	19	13
New England cottontail - Efforts to sustain populations must involve a landscape perspective to assure demographic exchanges between populations and long-term survival of the species.	21	13
New England cottontail - Wildlife habitat analysis efforts should emphasize vegetative structure and be directed to unraveling the complex habitat relationships of cottontails. Research also is needed on the emigration and dispersal of this species. Additionally, its natural regulation processes are not clearly understood. Research designed to establish the parameters of minimum viable populations in fragmented habitats also should be initiated.	1, 2, 7	13
New England cottontail - More research is needed to understand the role that the spread of the eastern cottontail has played in the decline of the New England cottontail. Population monitoring of the New England cottontail should be implemented throughout its range to better document status and population trends.	1, 2, 7	13
Northern bog lemming - Much additional information is needed on population parameters, movements, and habitat requirements for this species. Targeted surveys are the greatest research priority, especially in New Hampshire and Maine where large areas of protected potential habitat exist, in order to determine its status and to gain information on the species there.	1, 2, 7	14
Bog lemming - Maintain a 100m buffer for management activities around riparian areas or corridors where sphagnum mats occur, and avoid human activities that alter stream flow in drainages where sphagnum mats are present.	1, 2, 8	14
Voles - Development of effective survey techniques and regional guidelines for sampling also is needed. A management profile of sites where rock voles occur should be developed and maintained. These profiles should reflect the status of the population, abundance or density estimates, characterization of the habitat, land uses near or around the sites, and their trends. Mapping and identifying essential habitat characteristics at known vole sites can be used (through GIS technology, GAP analysis, and habitat modeling) to identify potential habitat and possibly even predict where other populations might exist. Additionally, potential corridors should be identified.	1, 2, 7, 21	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Voles - Life history patterns require further study. Specifically, factors that adversely impact the vole require identification so they can be addressed in management guidelines. Areas where populations are known or found to exist should be protected and monitored. These boreal communities are especially rare and worthy of protection to shelter the assemblage of species they support.	1, 2, 7	17
Voles- Direct loss of individuals due to small mammal trapping associated with other studies should be closely monitored and regulated. Efforts to avoid this type of loss should be addressed through permitting, education, and enforcement efforts.	1, 2, 13, 19	17
Northern water shrew - Additional surveys of this species to find remnant populations in the southern portion of its range need to be conducted. Known locations and newly found occupied sites should be vigorously protected since evidence indicates that microhabitat features are critical to the Northern water shrew's survival.	1, 2, 7	18
Northern water shrew - The best protection efforts, at this point, would be acquisition of the sites where these shrews exist, or protection through easements. The boreal communities occupied by this species are especially rare and worthy of protection. Occupied sites should be mapped and a low-impact monitoring program put in place. The use of GIS technologies and modeling can identify potential habitat and corridors vital for dispersal of water shrews and other species of conservation concern. Habitat inventory techniques should be developed to help survey for this species.	1, 2, 7	18
Northern water shrew - State wetland protection efforts can address some of the environmental threats. The maintenance of stream banks, protection of water quality at the level that fish and other aquatic faunal communities require to remain intact, and the protection of the integrity of the shorelines are important management measures that should be encouraged and enforced.	1, 2, 7, 8, 9	18
Northern water shrew - Multi-state agricultural and timbering BMPs should be encouraged and enforced in an effort to control runoff containing herbicides, pesticides, fertilizers, and silt. Efforts should be made to promote the fencing of livestock from streambeds and the maintenance of riparian buffers through incentive and stewardship programs. Managers should make it a top priority to work with sister regulatory agencies to ensure that industrial, municipal, and agricultural facilities make a continuing effort to reduce stream-contaminating effluents and prevent catastrophic pollution events. Efforts should be made to reduce urban runoff by coordinating with localities and state transportation departments to determine appropriate locations of planned roads.	15, 16, 21	18

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northern water shrew - Land management practices for boreal forests should be outlined and made available to resource management agencies responsible for potential and known habitat, and to local and county land-use planning offices.	1, 2, 16	18
Northern water shrew - The natural history of the northern water shrew needs further study in order for more detailed management recommendations to be drafted. All aspects of microhabitats at known sites should be investigated and described. There are almost no data on home range size and population density.	1, 2, 7	18
Whales- Implement recovery and management plans from USFWS and NMFS, with regional (ASMFC) and local coordination as transients utilize Connecticut waters		
Harbor porpoise - Rates of incidental take need to be monitored closely with the use of both fisheries observers and stranding networks.	13	9
Harbor porpoise - Improvements in gear technology are greatly needed, as is more research to investigate the effectiveness of existing take reduction strategies such as pingers and seasonal area closures. If necessary, additional restrictions on the use of sink gill nets will be required if improved gear technology and seasonal area closures do not succeed in keeping the bycatch to 10% of the PBR.	13	9
Harbor porpoise - More data should be gathered on habitat use of the waters off the mid-Atlantic by this species, especially in the winter and spring seasons. Sighting surveys should be increased. A long-term study should be initiated in which individual porpoises are captured and fitted with radio transmitters to document use of commercial fishing areas, length of stays, and general movements patterns.	1, 2, 7	9
Harbor porpoise - GIS technologies should be employed to map area use, to collect data, and to predict habitat use off the shores of Connecticut, New York, and New Jersey.	1, 2, 7	9
Harbor porpoise - More research on acoustical devices is needed. Acoustical devices with a frequency that may deter the harbor porpoise may actually be an attractant to other marine mammal species (whales or seals).	13	9
Deer - Continue the Burnham Brook deer management program with possible expansion into State forest and other forest patches. Deer management would also be pursued through partnerships to outreach with large private forest landowners and land trusts to allow hunting on their properties.	1, 4	22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Support the growing interest in bat conservation and management, as evidenced by the creation of state and regional bat working groups, along with the establishment of the North American Bat Conservation Partnership and the creation of an international bat conservation strategy	19	1
Public education, interpretive signs, closures of access roads and trails, fencing, and gating help reduce roost disturbances. Bat-friendly gates placed across important cave and mine entrances prevent human entry into key roosts while allowing many bat species to enter and exit.	19	1
Quantify the economic and social impacts of North American bats: Conduct research to quantify the economic values of bats, with special emphasis on consumption of crop, garden, and forest pests, as well as on eco-tourism associated with bat-watching sites. Conduct research to document the role of bats in plant pollination, seed dispersal, and nutrient dynamics of ecosystems. Document verified bat rabies risks and prevention costs relative to other diseases.	19	2
Develop standards and protocols to enhance research quality, and minimize harm to bats during the course of research: Evaluate technologies to monitor bat species and numbers entering and exiting roosts. Examples include ultrasonic detection, photography, and thermal-infrared imagery. Test and compare the reliability of bat survey, census and identification techniques. Encourage the continued refinement of echolocation detection technology. Establish protocols for the use of bands and encourage maximization of recovery information to advance scientific discovery. Establish bat researcher-training programs to increase field competency and minimize harm to bats.	19	3
Encourage international cooperation and incorporate bats that cross borders into broader wildlife programs such as research, inventory, monitoring, and habitat assessments. Identify and encourage collaboration with other organizations that have responsibility for natural resource inventory and monitoring. Establish roles and responsibilities for data collection and sharing where there are overlapping priorities and information needs.	19, 21	3
Develop and distribute educational materials to reach especially important audiences: Encourage wildlife managers, professional caving groups, animal control and public health officials, and bat rehabilitators to help by developing and distributing specialized materials, such as technical field manuals, handbooks, and brochures. Develop and implement education and conservation programs about bats living in urban environments. Prepare and implement monitoring plans to evaluate educational program effectiveness.	19	3

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Integrate bat education materials into other appropriate programs and materials: Encourage inclusion of bat educational curricula, such as <i>Discover Bats!</i> , into the most widely known environmental education programs, for example <i>Project Wild</i> , <i>Project Learning Tree</i> , <i>Backyard Habitats</i> , and others. Provide teacher instructions about how and where bats can be incorporated into existing textbook lessons, including audiovisual programs and educational materials. Develop and implement public participation programs, and provide educational materials to empower volunteers to assist with outreach and education efforts, such as bat walks, lectures, school presentations, and other activities.	19	3
Foster collaboration with individuals, organizations, and agencies that can help promote bat conservation: Promote collaborative educational programs between bat researchers, the conservation community, and local public-service agencies, such as power and water companies, county extension agents, and departments of transportation. Strengthen ties with public health officers, bat rehabilitators, and timber, agricultural, and cattle organizations to empower them to lead bat education initiatives for their constituencies.	19, 21	3
Focus educational efforts on the most important issues and locations for bat conservation: Target bat education programs in communities near important bat roosts or other key habitats.	19	3
Incorporate bat conservation language into existing statutes for wildlife protection, giving bats equal consideration with birds: Work with legislators and governments to establish domestic policies and agreements for bats, with special emphasis on migratory species.	19, 21	3
Integrate strategic plans for bats into other existing plans and initiatives: Identify and act on opportunities to collaborate with other wildlife interest groups in the North American Bat Conservation Partnership. Identify other international wildlife planning efforts such as the North American Bird Conservation Initiative, and investigate ways to collaborate on overlapping and complementary goals.	19, 21	3
Develop and implement conservation and education programs for bats living in urban environments.	19, 20	3
Land protection strategy for river and forest targets includes working with and promoting protection by partners, finding new land protection partner funding, establishing viable methods for limited development such as the Land Bank concept, and facilitating increased open space capacity through bonding with local municipalities.	19, 20	22
Seek Congressional Wild and Scenic River designation for the Eightmile River both for its protection from any adverse federally funded or permitted water resource projects, and for its role in mobilizing local protection efforts and a watershed management plan. Launch a municipal initiative to strengthen local planning and regulatory processes through organized outreach by a partnership of respected agencies and grassroots interests in the project area.	18, 19, 20	22

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
<p>The relative efficacy of conservation measures should be evaluated with respect to their potential for reducing bycatches while minimizing costs to individuals in the gillnet fishery.</p> <p>If acoustic alarms appear effective for reducing porpoise bycatches in the Bay of Fundy, they should be required in other areas exhibiting porpoise bycatches provided that monitoring continues and observers are allowed on board. If acoustic alarms are not found to be effective, governments may have to ultimately work towards the elimination of gillnets while minimizing the financial impact on those involved. Possible measures include: provide subsidies to buy-back gillnet licenses and to promote a switch to more selective gears; implement time-area restrictions on the use of gillnets; promote lower dock-side prices for gillnet-caught fish and; maintain the moratorium on the issuance of new gillnet licenses.</p>	13, 19	19
<p>Create and maintain a centralized database of all DEP activities distributed to all staff workstations. This system would not have specific data, but would track the fact that data exist for a particular place. Data would be entered as they were collected. One would query by location to see if anyone collected data from that location, and if data exist it would be up to the requestor to track down the actual data. It would require revamping the IT department.</p>	18, 19	23
<p>Establish a single GIS projection standard for all DEP departments to share data layers more effectively.</p>	18, 19	23
<p>ECO system, GIS access program that has potential for more layers as they become available. Safeguards of all historical data with historical layers of past land use, spills, kills, violations, etc.</p>	18, 19	23
<p>Maintain records of survey data, management data and other data types in compatible GIS layer</p>	18, 19	23
<p>BioMap of Connecticut – to identify and map the areas most critical to protecting the state’s biodiversity and conducting gap analysis</p>	18, 19	23
<p>GIS mapping at the county or watershed level – habitat types, DEP lands, open space lands, contiguous forest cover, agricultural lands, etc. Determination of how much grassland, shrubland, vernal pools, etc. remains</p>	18, 19, 20	23
<p>Complete phase II of the WMA GIS habitat mapping project that involves ground truthing and additional aerial photo interpretation</p>	18, 19	23
<p>Develop an invasive plant and animal species database – much like the T and E database, so that the spread or containment of invasives can be monitored. Conduct a state lands invasive plant inventory/GIS mapping contract.</p>	18, 19	23
<p>Establish and maintain a database with all pertinent wildlife information such as surveys, habitat types, etc. for use by DEP Wildlife Division personnel (like ECOS but specific to Wildlife Division)</p>	18, 19	23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Contract a professional to research and investigate the best options for securing stable funding for the Division as a whole and/or specific programs (i.e. habitat stamp, Act 490 expansion, tax on real estate conveyances, etc.) and to work on developing a more positive Division image known to a larger segment of the public	18, 19	23
Purchase a brontosaurus for conducting work on both state and private land and contract or durationally hire someone to operate it.	18, 19	23
Conduct 4 WMA natural resource inventories per year to obtain baseline information on which to base sound management decisions. There are a total of 90 WMAs statewide. Contract a GIS specialist to complete/conduct GIS habitat mapping of all WMAs, followed by state forests and other DEP lands managed specifically for wildlife. Information would include habitat types, forest stand types and age classes, capitol improvements, T and E species, etc.	18, 19	23
Contract a biologist to develop a statewide forest/wildlife strategic plan that addresses where we are now, sets specific objectives on where we need to be in regards to biological old growth areas, seedling sapling areas, varying rotation lengths, cutting periods, etc.	18, 19	23
Re-visit county by county large 2,500 acre forest parcels to address forest fragmentation issues	18, 19, 20	23
Properly manage the approximately 1,500 acres DEP administered agricultural lands principally on WMAs for wildlife species rather than just providing cheap land for local farmers.	18, 19, 15	23
Expand/improve “Connecticut Wildlife” to include outside authors, full color, etc. Expand the role/impact of Public Awareness.	19	23
Fund appropriate improvements/maintenance and professional staff for one or two demonstration sites in the state (Sessions and perhaps Goodwin)	18, 19	23
Coordinate the effort of the LIP program and SWG to effect habitat management on private land, which comprises most of the habitat for species of greatest conservation need in Connecticut	18, 21	23
Establish water quality standards for nutrients in rivers, lakes, estuaries, and coastal waters; establish ambient water quality standards for nitrogen, and on a watershed-by-watershed basis identify additional nutrients and toxic pollutants for which water quality standards are needed	9, 12	21
Require watershed-based water quality compliance planning	8, 9	21
Provide a complementary suite of incentives for improving water quality and disincentives for activities that harm water quality	9	21

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

"Other" Conservation Action (including policy and education)	Threat Addressed	Source
Municipalities and counties should change their zoning and subdivision codes to promote compact growth near urban centers, to discourage growth outside town centers in rural areas, and to reduce impervious surface cover wherever possible	8, 9, 20, 21	21
Require local growth-management planning as a condition for receipt of state and pass-through federal development assistance, and ensure that state and local growth and transportation planning comport with statewide habitat protection plans	20, 21	21
Coordinate policies and practices among local jurisdictions and, to the extent possible, with adjacent states to ensure a rational regional approach to growth management	20, 21	21
Fund development of biological nutrient removal technology standards to reduce nitrogen loads from publicly owned treatment works and for municipalities to install biological nutrient removal treatment in watersheds where such loads are a significant source of water quality impairment	9	21
Develop an inventory of existing species and their historical abundance for each regional marine ecosystem		21
Evaluate requiring the utilization of best available sound control technologies, where the generation of sound has potential adverse effects	9	21
Support the study of the effects of toxic substances in the marine environment	9, 10	21
Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic habitat	19	26
Continue education and training for appointed and elected volunteers at the municipal level who oversee wetland regulation; improve guidance to better integrate wetland protection with surrounding upland areas and from impacts of stormwater management practices	1, 2, 9, 19, 20	26
Educate local decision-makers on how to deal adequately with nonpoint sources of pollution. Focus on the reduction of impervious surfaces, reduce blacktop and sidewalks, whenever feasible	9	26
Enhance the public's understanding of resource conservation and natural diversity, and foster beneficial land use practices through educational programs and demonstration areas	19	26
In development projects, seek to avoid significant impacts to essential fish and wildlife habitats and migration corridors	20, 21	26

BIRDS: Compilation of Conservation Actions for Connecticut from Existing Management Plans and Literature

Source Codes:

- 1 = USFWS Development Assistance Team – Compilation of Region 5 Bird Plans, unpublished (summarizes conservation actions identified by SAMBI, MANEM Regional Group, PIF, BCR 30 workshop, et al.)
- 2 = Audubon Connecticut (1/15/04): Toward a Bird Conservation Strategic Plan, DRAFT
- 3 = Connecticut Audubon (2003): Protecting Connecticut's Grassland Heritage Report
- 4 = The Ruffed Grouse Society (<http://www.ruffedgrousesociety.org>)
- 5 = Kelley (2003): American Woodcock Population Status (<http://migratorybirds.fws.gov/reports/status03/Woodcock.pdf>)
- 6 = USFWS (1996): Piping Plover Atlantic Coast Population Revised Recovery Plan
- 7 = NEES&WDTC (draft): American bittern (*Botaurus lentiginosus*)
- 8 = NEES&WDTC (draft): Appalachian Bewick's wren (*Thryomanes bewickii altus*)
- 9 = NEES&WDTC (draft): Bicknell's thrush (*Catharus bicknelli*)
- 10 = NEES&WDTC (draft): Black tern (*Chlidonias niger*)
- 11 = NEES&WDTC (draft): Canada warbler (*Wilsonia canadensis*)
- 12 = NEES&WDTC (draft): Cerulean warbler (*Dendroica cerulea*)
- 13 = NEES&WDTC (draft): Common tern (*Sterna hirundo*)
- 14 = NEES&WDTC (draft): Golden eagle (*Aquila chrysaetos*)
- 15 = NEES&WDTC (draft): Golden-winged warbler (*Vermivora chrysoptera*)
- 16 = NEES&WDTC (draft): Harlequin duck (*Histrionicus histrionicus*)
- 17 = NEES&WDTC (draft): Henslow's sparrow (*Ammodramus henslowii*)
- 18 = NEES&WDTC (draft): Least tern (*Sterna antillarum*)
- 19 = NEES&WDTC (draft): Loggerhead shrike (*Lanius ludovicianus*)
- 20 = NEES&WDTC (draft): Long-eared owl (*Asio otus*)
- 21 = NEES&WDTC (draft): Louisiana waterthrush (*Seiurus motacilla*)
- 22 = NEES&WDTC (draft): Northern harrier (*Circus cyaneus*)
- 23 = NEES&WDTC (draft): Pied-billed grebe (*Podilymbus podiceps*)
- 24 = NEES&WDTC (draft): Red knot (*Calidris canutus*)
- 25 = NEES&WDTC (draft): Saltmarsh sharp-tailed sparrow (*Ammodramus caudactus*)
- 26 = NEES&WDTC (draft): Sedge wren (*Cistothorus platensis*)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

- 27 = NEES&WDTC (draft): Short-eared owl (*Asio flammeus*)
- 28 = NEES&WDTC (draft): Upland sandpiper (*Bartramia longicauda*)
- 29 = NEES&WDTC (draft): Whip-poor-will (*Caprimulgus vociferus*)
- 30 = USGS - Northern Prairie Wildlife Research Center's grassland bird reports (2003)
- 31 = Audubon Connecticut Science and Bird Conservation Strategic Plan – Appendix Connecticut IBA Site Priorities
- 32 = PIF Continental Priorities and Objectives Defined at the State and Bird Conservation Region Levels – Connecticut
- 33 = Population Declines of the Least Tern in Connecticut, Connecticut Ornithological Association, 2003

Threat Addressed by Conservation Action Codes:

- 1 - Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction projects, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)
- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in Long Island Sound and Estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

20 = Unplanned urban development and growth (inability to control or influence private land development under local jurisdiction, lack of information to municipalities, lack of landowner incentives, population growth, changing economy, etc.)

21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

Habitat-Focused Conservation Action	Threat Addressed	Source
Identify and monitor important foraging, wintering, and migrating areas. (S. Atlantic Migratory Bird Initiative)	7	1
Create a patch-based, GIS system for evaluating priority habitats (BCR 30 workshop)	1, 2, 5, 21	1
Implement a region-wide habitat identification and ownership analysis; collect ownership/contact information (BCR 30 workshop)	1,2, 21	1
Maintain and coordinate habitat protection of areas already owned by federal, state, local government or NGO's.	1, 2, 21	1
Create and restore habitat in focus areas through manipulation, augmentation, etc.	1, 2	1
Protect marshes from chemical contamination, siltation, eutrophication, and other forms of pollution.	1, 9	1
Develop and implement a program for adaptive impoundment management in the northeast in cooperation with the project underway in the southeast (BCR 30 workshop)	1, 2, 21	1
Develop list of all managed impoundments; include contact information request that managers participate in achieving regional goals for managed wetland area. (BCR 30 workshop)	1, 2, 21	1
Assess habitat quality for foraging shorebirds through resource or energetic studies in representative habitats throughout the BCR. (BCR 30 workshop)	1, 2	1
Continue or develop and implement invasive species removal program	1, 3	1
Conduct vegetation studies (MANEM working Group)	1, 2, 21	1
Restore Norwalk Island (MANEM working Group)	1	1
Implement oil spill response planning and simulations or partner with those that are currently participating in these types of activities. (MANEM working group)	9	1
Monitor and quantify habitat and food resources prior to oil spill as preparation for quantifying the direct and indirect impacts of a spill. (MANEM working group)	9	1
Implement post spill surveys to accurately quantify spill damages. (MANEM working group)	9	1
Secure adequate upland buffers (drier habitats adjoining wet marsh areas), especially for marshes near agricultural lands and human development. (PIF)	1, 2, 15, 20	1
Identify landowners of upland buffers, initiate landowner contact and determine best protection—acquisition, fee, easement.	1, 20	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Develop and implement a regional monitoring program targeting coastal marshes in order to track population trends and estimate population sizes for all groups of birds	7, 21	1
Study how land-use practices such as ditching, impounding, dredging, open marsh water management, burning, and marsh restoration impact wetland species to determine optimal habitat management practices. (PIF)	1, 2, 15, 8	1
Continue to support state IBA Program	1, 21	1
Dredge material has been successfully used in some instances to create new habitat, especially for least terns and common terns, although all habitat alterations should be conducted with caution and after consultation with experts; new substrates should not be overly silty and depositions with over 20% shell material could interfere with nest construction. (PIF)	1, 2,	1
Utilize dredged material to implement erosion control efforts. (Tern Management Handbook)	1, 8	1
Vegetation encroachment can degrade habitat for terns and should be prevented at important nesting sites. Addition of dredge spoils on vegetated beach areas may impede succession. (PIF)	1	1
Conduct vegetation studies and remove vegetation where it is deemed excessive with the appropriate tools (fire, hand-pulling, grazing, etc). (MANEM working Group and Tern Management Handbook)	1, 2, 3	1
Implement floating rafts where flooding threatens nesting species. (Tern Management Handbook)	1, 8	1
Identify key areas for invasive (Phragmites, purple loosestrife) control and evaluate effect on priority areas. (MANEM working group and PIF)	1, 3	1
Compile current knowledge and assess impacts of beach replenishment and shoreline hardening on shorebirds. (BCR 30 workshop)	1, 20	1
Use fences and other barriers to reduce predator impacts	4	1
Implement predator control plans where they do not already exist.	4	1
Preserve all large (> 10 ha) freshwater wetlands from development, draining, and other forms of habitat loss. (PIF)	1, 20	1
Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during both the breeding and non-breeding seasons. (PIF)	1	1
Continue to implement Wetland Protection regulations.	1	1
Investigate wetland management alternatives that can provide a variety of wetland habitat conditions that are suitable to the various needs of the priority species in this habitat suite. (PIF)	1	1
Wetlands used as breeding sites should be protected from chemical contamination, siltation, eutrophication, and other forms of pollution/contamination that could directly harm breeding birds or their food supply. (PIF)	9	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Hemi-marsh conditions favored by grebes and ducks need to be maintained by periodic reversal of vegetation succession to open up some of the extensive stands of emergent vegetation, but suitable habitat for nesting needs to be maintained in nearby areas during wetland management. (PIF)	1, 2	1
Work with partners, such as IPANE, to remove invasive species from infested priority habitats	3	1
Creation of new nesting habitat may be needed for some species by minor alterations to existing management activities for waterfowl, such as leaving some dense stands of cattail and bulrush for nesting sites and maintaining fairly stable water levels during the nesting season, should benefit many of these species (PIF)	1, 2, 8	1
Complete drying of impoundments during drawdowns should be avoided to prevent the die-off of small fish, amphibians, and dragonflies, which are a major food sources for many of these bird species. (PIF)	8	1
Slow drawdowns should benefit bitterns by providing suitable foraging habitat and encouraging dense stands of emergent vegetation for nesting. (PIF)	8	1
Design a regional management program for these wetland species that continue to be threatened by habitat loss, including increased coordination among managers and biologists to prevent duplication of research efforts and to share current information.	21	1
Develop a targeted monitoring program for high priority freshwater wetland species. Coordinate with PIF projects. (BCR 30 workshop)	7	1
Utilize standard methods for conducting freshwater wetland species point-counts using tape-recorded vocalization playback. (PIF)	7	1
Determine causes of freshwater wetland breeding failure and mortality of young and adults. (PIF)	7	1
Conduct land use analysis to identify all remaining large forest block (e.g., ≥ 350 ha) and landscapes with high % forest cover (e.g., $> 70\%$). (PIF)	1	1
Create and restore forest habitat in focus areas through manipulation, augmentation, connecting smaller forest blocks to create large patches, etc (PIF)	1	1
Assess vegetation structure to ensure that appropriate structural characteristics of the habitat are being maintained. (PIF)	1	1
If forest stands have reached a late-successional stage but have little shrub or mid-canopy vegetation and few breaks in the canopy, low-level management through selective cuts or thinning may improve habitat conditions. (PIF)	2	1
Assess the effects of various logging practices (especially selection and shelterwood cuts) on occurrence, breeding density, and nesting success of the priority species (PIF)	16	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Develop specific forest management guidelines for high priority species. (BCR 30 workshop)	16	1
Develop guidelines for recommended deer densities that are compatible with reversing declines of priority forest birds. (BCR 30 workshop)	1	1
Develop a targeted monitoring program for high priority forest species. Coordinate with PIF projects. (BCR 30 workshop)	7	1
Design and conduct targeted monitoring program to track population trends of forest interior species that are not well covered by BBS in this physiographic area. (PIF)	7	1
Monitor reproductive success of this suite of species at different locations throughout region to better understand where forest fragmentation causes problems and where it does not. (PIF)	1, 7	1
Assess sensitivity of species in this habitat suite to pesticides currently being used to control gypsy moths and other insect pest species. (PIF)	9	1
Determine relative importance and use of other habitat types during the post-fledging period prior to migration. (PIF)	1	1
Identify and protect all remaining pine barren habitat.	1	1
Identify powerline rights-of-way to be managed to provide habitat for shrubland birds. (PIF)	2	1
Sustain habitat through collaborative management of areas that already are subjected to frequent human disturbance from agriculture, forestry, or the maintenance of roads and rights-of-way. (PIF)	2, 15, 16	1
Compare early successional habitats resulting from natural disturbances vs. forestry practices vs. power line rights-of-way with regard to suitability for high-priority species, including breeding densities and nesting success. (PIF)	2, 15, 16	1
Determine if there is relationship between patch size and nesting success for shrubland birds, and between patch size and breeding density for the more area sensitive species. (PIF)	1, 7	1
Continue clearcutting as a means of providing shrub habitat on state forests. (PIF)	16	1
Implement careful planning of rotational harvest schedules. (PIF)	16	1
Maintain right-of-ways by selectively spraying herbicide on the base of tall-growing trees. (PIF)	1, 9, 16	1
Develop and implement integrated management plans for grasslands on civilian and military airfields. (BCR 30 workshop)	1	1
Increase utilization of Farm Bill programs to benefit priority grassland and shrubland birds.	15, 18	1
Expand traditional game management in early successional habitats to include nongame bird priorities and objectives; including evaluation of effects of traditional game management on priority nongame species	17	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Identify and protect key areas, especially large grasslands, for immediate conservation efforts. (PIF)	1	1
Determine if differences exist in grassland breeding bird diversity and abundance in the Northeast between warm season and cool season grass types. (PIF)	1, 7	1
Coordinate with other states to develop and implement a comprehensive grassland management plan for the entire New England region. (PIF)	1, 21	1
Mowing, burning, and controlled grazing can be used to maintain grasslands, but the most appropriate methods for each site must be carefully considered and input from regional grassland experts is strongly encouraged. (PIF)	1, 21	1
Consider consolidation of adjacent grassland fields, through the elimination of hedgerows, stone fences, or tree lines, in areas where open land occupies a considerable amount of the surrounding landscape and grassland management can be identified as a reasonable management alternative. (PIF)	1	1
Implement a prescribed fire program where this management technique would be considered appropriate. (PIF)	1	1
Determine if current mixtures of warm season grasses has failed to provide adequate habitat for grassland breeding birds. Focus on cool season grasslands if needed. (PIF)	1	1
Implement mowing program where appropriate. (PIF)	1	1
Continue monitoring grassland habitats within the physiographic area as part of a regional effort within New England to better assess grassland bird abundance trends. (PIF)	1, 21	1
Research different management techniques to understand the appropriateness of prescribed burning, mowing, and other methods for maintaining suitable habitat for Northeastern grassland birds. (PIF)	1	1
Conduct demographic studies (productivity, survival, dispersal) of priority grassland/agriculture species to provide information needed for determining causes of population declines and understanding metapopulation dynamics	7	1
Ensure implementation of Connecticut Grasslands Working Group Recommendations.	21	2
Develop conservation plans for identified IBA's...and start implementation.	1	2
Address both core area and IBA buffer areas in conservation planning; Define appropriate size buffer area based on site specific criteria; Identify conservation opportunities within the defined buffer area; Identify key players and possible partners within buffer area; Define strategies for coordinating conservation strategies within the buffer.	1, 21	2
Outline management and restoration needs/opportunities in site specific conservation plans	1	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Coordinate restoration and management efforts with other groups with overlapping interests at IBAs, e.g. Landowners, TNC, DEP, USFWS, regional conservation groups, sportsmen groups.	21	2
Assess the impact of fertilizers/pesticides and other chemicals on Long Island Sound and the potential impacts of climate change on birds, wildlife and habitat.	8, 9, 12	2
Analyze existing and potential grasslands statewide, and establish goals for grassland protection, including number of acres to be protected and managed.	1	2
Develop a plan and specific recommendations (including the need for legislative action) to ensure progress toward grassland protection goals	1	2
Provide advice on the technical aspects of restoring and maintaining grasslands	1	2
Establish and maintain an inventory of protected grasslands	1	2
Identify research needs and priorities and encourage research that would advance grassland conservation.	1	2
Audubon Connecticut work with DEP on implementation of forest resources plan	21	2
Audubon Connecticut work with DEP to ensure bird conservation objectives are incorporated into the Comprehensive Statewide Wildlife Planning process.	21	2
Monitor and support the work of the Connecticut Invasive Plants Council	21	2
Provide information on relationship of plants to birds and provide perspective to the Invasive Plants Council as affected landowners	21	2
Evaluate research data behind invasive plant lists	3	2
Assess the impact of invasive plants on habitat quality, and define applicable management strategies ranging from education and control to eradication	3	2
Assess impacts of eradicating invasive plants versus leaving them in place	3	2
Provide scientific support for advocacy efforts aimed at reducing the impacts of light pollution	9	2
Regularly assess progress, and conduct a comprehensive review of Audubon Connecticut's Bird Conservation Programs every 3 years, in cooperation with the IBA Technical Committee, developing specific measures of success for Bird Conservation and IBA programs.	21	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Maintain at least five occupied large natural or managed grasslands (i.e., sites planted with native, warm season grasses and managed through periodic burning or mowing and ranging in size from 30-acres minimum for smallest occupied habitat for Grasshopper Sparrow to 500 acres for 50% incidence for Upland Sandpiper) needed for adequate species protection. Management should be on a rotated basis to ensure the greatest variety of successional grassland stage; i.e., managing a portion of the field each year, so that the entire grassland will not be managed in the same year. Given that there is only a 50% probability of birds actually occurring in sites of the minimum size, ten such sites would be necessary to ensure five nesting locations.	1	3
Give priority to existing grassland and lands that can be restored to grassland under State land acquisition programs (Recreation and Natural Heritage Trust Program, Municipal and Watershed Grants Program, Farmland Preservation Program).	1, 18	3
Establish a 5,000-acre network of natural grasslands in blocks of at least 500 acres. There is an immediate need to replace grassland habitat that will be lost by the planned development of Rentschler Field and inevitable expansion of cargo facilities at Bradley International Airport. Habitat to replace grassland at these two locations should be located in the upper Connecticut River Valley.	1	3
Encourage and support GIS based analysis to identify existing grassland habitats and areas in which habitat management for grassland species would be most effective and appropriate.	1	3
Continue the precedent set by the mitigation efforts for the University of Connecticut football stadium at Rentschler Field, by maintaining a 3:1 ratio of new grassland to grassland lost for any State-funded projects, or projects that require permits from the State, that destroy or degrade habitat for State-listed grassland species.	1	3

Species-Focused Conservation Action	Threat Addressed	Source
Key Bird Species at Connecticut IBS sites -Monitor population levels and changes in population in response to conservation activities and threats at those sites.	7	2
Key Bird Species in Connecticut - Target those species for which Connecticut has a high global responsibility i.e. where Connecticut supports a significant percentage (>1%) of the global population: Blue-winged Warbler, Saltmarsh Sharp-tailed Sparrow, Piping Plover, American Oystercatcher, American Black Duck, Greater Scaup, Worm-eating Warbler, Louisiana Waterthrush, Wood Thrush, Gray Catbird, Scarlet Tanager -	7	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Key Bird Species in Connecticut -Target species of global or continental conservation concern (IUCN, Watch List 'Red' species, federally listed species) wherever they occur: Saltmarsh Sharp-tailed Sparrow, Piping Plover, Roseate Tern, Bald Eagle, Black Rail, Buff-breasted Sandpiper, Cerulean Warbler, Golden-winged Warbler	7	2
Seabirds - monitor death and morbidity. (S. Atlantic Migratory Bird Initiative)	7	1
Colonial Seabirds - Develop and implement strategy to monitor (MANEM Regional Working Group)	7	1
Seabirds - Increase monitoring of seabird bycatch. (S. Atlantic Migratory Bird Initiative)	7	1
Seabirds - Determine population level effects of oil and hazardous materials. (S. Atlantic Migratory Bird Initiative)	9	1
Seabirds - Determine effects of sargassum harvest to habitat and populations. (S. Atlantic Migratory Bird Initiative)	14	1
Shorebirds - Incorporate shorebird management at all appropriate impoundments. (BCR 30 workshop)	1,8	1
Shorebirds - Participate in the implementation of the Program for Regional and International Shorebird Monitoring (PRISM)	21	1
Shorebirds - Design and conduct coordinated aerial survey targeting migrating shorebirds in spring (BCR 30 workshop)	7	1
Shorebirds - Develop a targeted monitoring program for high priority shorebird species, including staging and migration sites (coordinate with PIF projects). (BCR 30 workshop)	7	1
Shorebirds - Monitor for responses to current management practices and analyze threats to priority sites. (BCR 30 workshop)	7	1
Shorebirds - Conduct an immediate analysis of current threats from ongoing aquaculture projects. (BCR 30 workshop)	14	1
Beach nesting birds- Expand existing protection programs to increase shorebird roosting	7	1
Beach nesting birds -Maintain breeding season exclosures and monitor their effectiveness (BCR 30 workshop)	4, 6, 17	1
Beach-nesting Birds - Research, assess, and implement control programs for mammalian and avian predators for high priority species (BCR 30 workshop)	4	1
Beach, Dune, Island Species - Continue to evaluate factors that limit populations of the priority species from this habitat suite and impede recovery, including studies of (a) habitat requirements for breeding, foraging, and staging, (b) demographics, (c) causes of mortality, and (d) factors limiting growth and survival of young	7	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Beach, Dune, Island Species - Investigate the behavior and population ecology of predators impacting the priority bird species to provide a better understanding of how to protect the birds from depredation.	4	1
Beach, Dune, Island Species - Investigate potential threats from pesticide and heavy metal accumulation.	9	1
Beach, Dune, Island Species - Monitor breeding and non-breeding populations of focal species to determine population size, status and trends.	7	1
Marsh-nesting Species - Investigate possible negative impacts that rising ocean levels from global climate change could have. (PIF)	8	1
Marsh Species - Support existing studies on disease (BCR 30 workshop)	10	1
Marsh Species - Develop appropriate predator control programs, especially for smaller marshes and marshes near human population concentrations	4	1
Wetland Species -Design a regional management program, including increased coordination among managers and biologists to prevent duplication of research efforts and to share current information.	21	1
Grassland Birds - Develop targeted monitoring/research program on demographics and habitat-area relationships for priority species building on and expanding the techniques developed by Massachusetts Audubon. (BCR 30 workshop)	7	1
Grassland Birds - at least two of the large warm season grassland tracts should be located as close as possible to Bradley International Airport and Rentschler Field in the Connecticut River Valley	1	3
Hayfield Birds - maintain this population level [of the 1980s, for hayfield habitat birds], with 3,250 acres of managed hayfield grassland habitat managed to allow for successful nesting, which means postponing haying until August or late July. Mowing earlier will destroy eggs or kill young before they fledge.	7	3
Grassland Birds - Continuation of the COA's 2001-grassland bird habitat use assessment, with an emphasis on areas inadequately covered in 2001, to better document the status of species	7	3
Grassland Birds - Initiate monitoring to ensure that implementation of the goals are resulting in desired population targets for grassland birds.	7	3
Common Species -Work to keep common birds common by focusing on WatchList Yellow species; and addressing threats proactively to ensure that additional species do not become threatened or endangered in the future	7	
Urban Birds -Understand impacts of pesticides (e.g., urban/suburban mosquito spraying) on this suite of urban species, including links to the current outbreak of West Nile virus. (PIF)	9	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Urban Birds - Compile better life history information on these species, such as kinds of nest predators and levels of nest depredation, breeding longevity and reproductive effort over time, characteristics of preferred nesting requirements, fidelity to breeding and wintering sites, and better assessment of migration routes and destinations. (PIF)	7	1
Terns - Identify key foraging sites, prey base and stocks in order to incorporate protection into oil spill response plans. (MANEM working group)	9	1
Terns - Utilize predator control management techniques in Tern Management Handbook.	4	1
Common Tern - maintain current population of 4,121 pairs (10 colonies). (Tern Management Handbook)	7	1
Common Tern – research needed on foraging habitat, winter habitat and relationship between forage fish abundance and availability	1	1
Common Tern - maintain successful management techniques including: fencing, vegetation control, predator control, sign posting, wardens and education programs. (Tern Management Handbook)	4, 6, 17	1
Roseate Tern - Maintain current population on Falkner Island. Population considered stable (Tern Management Handbook) but too few colonies exist.	7	1
Roseate Tern - Restoration of historical sites using social attraction, vegetation control, predator control, nest shelters, artificial nest habitat, sign posting, wardens, education programs, and law enforcement. (Tern Management Handbook)	1, 4, 6, 17	1
Roseate Tern - Continue research foraging habitat, migration routes, winter habitat use, protection and management.	7	1
Least Tern – maintain/enhance population at 4 sites identified as extremely important (Griswold point, Long Beach, Milford Point, and Sandy Point) colonies are very susceptible to human recreation and disturbance and predation, Continued management for these problems is necessary.	4, 6, 17	1
Least Tern –the most significant colonies of Least Terns (Sandy Point in West Haven, Milford Point in Milford, Long Beach in Stratford, and Pleasure Beach in Bridgeport) should receive elevated levels of protection.	7	33
Least Tern – These primary breeding locations should be isolated from terrestrial predators by ringing nesting sites with snow fencing. Human access to these locations should be monitored carefully and controlled as necessary to prevent disruption of tern colonies. Dogs and cats should be excluded from nesting sites under all circumstances.	4, 6, 17	33

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Least Tern - Active removal or relocation of predators (especially domestic pets) at these nesting sites should be initiated. Special attention should be paid to crows, as they are a demonstrated source of predation. In addition, nocturnal terrestrial predators should be removed as soon as they are found, since quick removal will limit the possibility that nocturnal abandonment will be institutionalized in a tern colony. Normally, nocturnal avian predators, such as Black-crowned Night Herons and Great Horned Owls, are hard to remove.	4, 6	33
Least Tern - Programs of education and outreach should be initiated to inform the beach-going public. Enhanced signage which includes information about tern biology and seasonal usage of these key nesting locations by terns would be extremely helpful	14, 19	33
Least Tern - Investigation of Massachusetts' successful management program for Least Terns and determination of those additional elements that may be applicable in Connecticut.	21	33
Least Tern - there should be active programs for managing vegetation removal at existing nesting sites. Such action will require resolution of potential legal and regulatory limitations on removal of beach vegetation	2	33
Least Tern - sites with lower numbers of breeding pairs should receive elevated levels of protection. Griswold Point in Old Lyme and Menunketesuck Island in Westbrook should be the focal points of this effort. Efforts should be made to maintain and improve the quality of these intermediate sites, including active management of beach vegetation	2, 7	33
Least Tern - consideration should be given to restoration of historical nesting locations (those that were productive in the past, such as Sand Point in Greenwich). Restoration could include actions to restore the physical appeal of the sites to terns, such as management of vegetation, enclosure of appropriate habitat with snow or electric fencing and exclusion of people and their pets.	2, 4, 6, 17	33
Least Tern - creation of new nesting habitats should be considered such as development of artificial nesting habitats on dredge-spoil islands. These islands can be created by placing dredge-spoil in barges anchored offshore from known nesting locations or, more appropriately, national wildlife refuges or state parks, isolated from the mainland. Dredge spoil also should be used to supplement and manage existing nesting sites or restore historical ones, so long as it matches the substrate characteristics preferred by terns	1, 5	33
Least Tern - Setting up tern decoys and broadcasting tern vocalizations has been used to encourage terns to establish new colonies or repopulate old ones. A decoy program could result in more rapid colonization of artificial or restored nesting habitats in Connecticut	7	33

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Least Tern - Analyze the performance of all nesting sites in the state and use that information in the management plans for these locations. This analysis must be conducted in the framework of a regional- or landscape-scale study of Least Terns in the northeastern United States. For example, it is possible that adult Least Terns are forsaking breeding sites in Connecticut for locations in adjacent states. Improvement of nesting conditions in our state could be beneficial to the species within the region, including reducing the risk associated with local disasters destroying individual nesting colonies.	7, 21	33
Least Tern – create new committee for the purpose of overseeing the restoration of Least Terns (“The Least Tern Working Group”) consisting of representatives from the Connecticut Department of Environmental Protection, the U.S. Fish and Wildlife Service, state universities, non-profit conservation organizations (including the COA) and other groups currently working on Least Tern research and/or management projects.	21	33
Least Tern – Create a management plan for the preservation of the Least Tern in Connecticut by September 30, 2004 so that scientific studies could begin with the 2005 breeding season.	21	33
Least Tern - Identify and implement long-term strategies to preserve and improve nesting colonies, including active management programs for limiting human disturbance, reducing predation of terns, and maintaining nest sites. Specifically, a special program should be formed to facilitate the management of coastal vegetation for improvement of nesting habitat. Plans should be in place by February 28, 2005 for the 2005 nesting season.	21	33
Least Tern - Identify and fund a formal program of study to determine the causes of population decline, including as-yet-unexplored issues as contaminants in food that may be harmful to Least Tern reproductive success	7	33
Least Tern - Coordinate with ornithologists and ecologists in other New England states to ensure that Connecticut’s Least Tern management actions are integrated on a regional basis and to compare population trends and identify regional problems this species faces in the near future	21	33
Least Tern - Create and maintain centralized information resources on issues of regional importance, such as identification and protection of foraging grounds and nesting colonies.	21	33
Least Tern - the Least Tern Working Group should actively participate in regional meetings dealing with New England’s water birds	21	33

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Least Tern - The Least Tern Working Group also can be an agent for enhancing public awareness of Least Terns and their plight. In order to protect existing Least Tern colonies, it is necessary both to educate the public on the fragility of the colonies and, where possible, to create greater restrictions to keep the public from disturbing the nesting sites. In suitable locations (e.g., those not closed to human access), observation areas (including platforms) should be set up in order for the public to generate support for protection of Least Terns and other wildlife (so long as such platforms do not disturb nesting colonies).	19, 21	33
Least Tern - site-specific conservation plans be developed for each priority site, taking into account their individual characteristics. Controls on the use of these sites by humans during the Least Tern's breeding season should be implemented. Attempts to reduce human disturbance to Least Terns must be accompanied by a public outreach program, including signs, brochures and the use of beach stewards to better inform the public about Least Terns and what they can do to help protect this state-threatened species. A major focus of this program should be the danger of pet dogs.	6, 17, 19	33
Least Tern - The conservation plans should be conducted in the priority sequence associated with current breeding success of Least Terns: plans for Sandy Point and Milford Point should be developed first, followed by conservation plans for Long Beach and Pleasure Beach. Sites that have been productive in the past, such as Sand Island, should follow in priority.	7	33
Least Tern - Specific analysis of elements identified as contributing to population decline in the state. The impact of human recreation activities on terns and their breeding behavior should be analyzed as soon as possible. This research should also be constructed to measure the success of immediate actions taken to stabilize the Least Tern population	7	33
Least Tern - Detailed analysis of key nesting sites in the state, including the ecological and human-induced factors affecting reproductive success at these locations. Such analysis may require an in-depth understanding of beach ecosystems, not just Least Tern ecology	7	33
Least Tern - Analysis of long-term management actions including predator control, vegetation management programs and enhancing public awareness. These management actions should be undertaken in the context of a properly structured scientific design addressing specific questions such as: Which predators cause the greatest mortality of Least Terns and what are the socially acceptable ways to control them? Which management actions are most beneficial to Least Terns and why? What is the success of Least Terns in delivering food to their offspring?	4, 6, 7, 17, 19	33

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Least Tern - Determine if factors specific to Long Island Sound, such as potential contamination by persistent organic chemicals, contribute to lower breeding success of Least Terns	9	33
Common Tern - The long-term survival of coastal common tern populations depends upon continued successful management of existing core colonies. Without continued management, including creation of stable funding sources, the future of these birds is uncertain.	18	13
Common Tern - The management of specialist predators is critical to the long-term suitability of some sites. Effective predator management is essential to maintaining common tern numbers along the East Coast.	4	13
Common Tern - Few data exist on the causes of adult mortality, except in the presence of predation and disease. More study is needed on common terns at their wintering grounds, where most of the mortality is presumed to occur.	7	13
Common Tern - Molecular and metapopulation studies of inland and coastal populations are needed to establish the relationships between these spatially distinct populations. This research also will provide information on dispersal between coastal colonies, migration to winter quarters, and survival rates (the last estimates of survival were from the 1970s and early 1980s).	7	13
Common Tern - More information also is needed on foraging habitat characteristics and the relationship between forage fish abundance and availability.	7	13
Common Tern - In addition, little is known about spring migration routes.	7	13
Least Tern - Man-made dredge areas should be considered as possible habitat and protected from disturbance.	2	18
Least Tern - Annual monitoring and posting of boundaries should be implemented.	6, 7	18
Least Tern - A restriction of foot travel within 1000 feet of any active colony is recommended.	6	18
Least Tern - Protective, "psychological" fencing of 2 strands of bailing twine has been effective in some areas. Maine Audubon found a double row of inner and outer fencing effective to compensate for tidal washouts and provide buffer zones.	4, 6, 7	18
Least Tern - Colonies should be posted against intruders with active enforcement by wardens coordinated with a media/education campaign.	6, 17, 19	18
Least Tern - Signage with bold, large print should be considered to discourage human intrusion close to sites.	6, 17, 19	18
Least Tern - ORV traffic lanes should be established at least 20 m from fencing boundaries.	17	18
Least Tern - There is a need to protect existing and potential nesting areas from mammalian predators, unleashed pets, habitat alteration, and human access.	4, 6, 17	18

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Least Tern - Predator control programs should be initiated where mammalian (including feral cats) and avian predators are a threat. "Kitty rope" has been an effective deterrent to cat predation in Maine. "Chick shelters" have been effective to protect chicks from avian, human, and dog threats on Nantucket.	4, 6, 17	18
Least Tern - Effective garbage disposal to discourage predators should be implemented within range of nesting habitat.	9	18
Least Tern - More research is needed on the effectiveness of relocating nests to avoid tidal losses or vehicle/pedestrian traffic.	6	18
Least Tern - Long-term information on population trends is needed in the Northeast, and monitoring programs should be coordinated on a regional level using standardized surveying techniques designed to have minimal impact on populations.	7, 21	18
American Oystercatcher – Menunketesuck Island is one of eight sites this species has been observed on. (Waterbird Monitoring Partnership) Maintain and enhance current populations.	7	1
American Oystercatcher - Maintain successful management techniques including: fencing, predator control, sign posting, wardens and education programs.	4, 6, 17, 19	1
American Oystercatcher - Acquisition or some form of protection of highest priority parcels critical.	18, 19, 20	1
Black-bellied Plover, Red Knot, Sanderling, Semipalmated Sandpiper, Ruddy Turnstone, Lesser Yellowlegs - Sandy Point and Morse Point (primary stopover habitat): Implement and conduct new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft.	7	1
Black-bellied Plover, Least Sandpiper, Red Knot, Sanderling, Semipalmated Sandpiper, Ruddy Turnstone, Lesser Yellowlegs- Milford Point (primary stopover habitat): Partner with landowners to monitor site and implement new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft.	7, 19	1
Black-bellied Plover, Sanderling, Semipalmated Sandpiper, Ruddy Turnstone, Lesser Yellowlegs - Menunketesuck Island (primary stopover habitat): Research willingness of landowners for acquisition, fee, or easement.	19	1
Black-bellied Plover, Sanderling, Semipalmated Sandpiper, Ruddy Turnstone, Lesser Yellowlegs - Menunketesuck Island (primary stopover habitat): Work with owners to reduce disturbance during critical times of migration.	19	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Black-bellied Plover, Sanderling, Semipalmated Sandpiper, Ruddy Turnstone, Lesser Yellowlegs - Menunketesuck Island (primary stopover habitat): Partner with landowners to monitor site and implement new surveys as stated in A Plan for Monitoring Shorebirds During Non-breeding Season-Draft.	19	1
Piping Plover - Maintain successful management techniques including: fencing, predator control, sign posting, wardens and education programs; utilize Piping Plover Recovery Plan recommendations.	4, 6, 17, 19	1
Piping Plover - Monitor population trends, productivity, and distribution in each recovery unit and breeding activities at nesting sites to identify limiting factors.		6
Piping Plover - Maintain natural coastal formation processes that perpetuate high quality breeding habitat by discouraging development that will destroy or degrade plover habitat, interference with natural processes of inlet formation, migration, and closure, and beach stabilization projects. To compensate for disruption of natural processes, create and enhance nesting and feeding habitat, especially in the vicinity of existing stabilization projects by encouraging deposition of dredged material to enhance or create nesting habitat and discouraging vegetation encroachment at nesting sites. Draw down or create coastal ponds to make more feeding habitat available.	1, 2, 8	6
Piping Plover - Reduce disturbance of breeding plovers from humans and pets, reduce pedestrian recreational disturbance, fence and post areas used by breeding plovers, as appropriate, implement and enforce pet restrictions, prevent disturbance from disruptive recreational activities on beaches where breeding plovers are present, reduce disturbance, mortality, and habitat degradation caused by off-road vehicles, including beach-raking machines. Provide wardens and law enforcement officers to facilitate protective measures and public education.	4, 6, 17, 18, 19	6
Piping Plover - Reduce predation by removing litter and garbage from beaches, deploying predator exclosures to reduce egg predation where appropriate and removing predators where warranted and feasible	4, 9	6
Piping Plover -protect breeding habitat from contamination and degradation due to oil or chemical spills.	9	6
Piping Plover -Monitor abundance and distribution at known wintering sites, survey beaches and other suitable habitat to determine additional wintering sites, identify factors limiting the quantity and quality of habitat or its use by piping plovers at specific wintering sites	7	6

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Piping Plover - Protect essential wintering habitat by preventing habitat degradation and disturbance from impacts of shoreline stabilization, navigation projects, and development, from disturbance by recreational users and their pets, from contamination and degradation due to oil or chemical spills. Apprise resource/regulatory agencies of threats to wintering piping plovers and their habitats. Evaluate and update lists of essential wintering habitat as data become available. Provide for long-term protection of wintering habitat, including agreements with landowners and habitat acquisition.	17, 20	6
Piping plover -Identify important migration stop-over habitat, identify and mitigate any factors that may be adversely affecting migratory stop-over habitat or its use by piping plovers.	7	6
Piping Plover - Investigate the wintering ecology of piping plovers; Characterize wintering habitat; Determine the spatial and temporal use of wintering habitat; Evaluate foraging behavior and resources for specific microhabitats at wintering sites; Investigate the effects of human disturbance on wintering plovers	7	6
Piping Plover - Refine characterization of plover breeding habitat; Compare plover foraging resources along Atlantic Coast breeding habitat; Determine moisture-related requirements for plovers and their chicks; Evaluate impacts of artificial inlet closure and other beach stabilization projects on piping plover breeding habitat suitability.	7, 21	6
Piping Plovers -Monitor levels of environmental contaminants in piping plovers.	9	6
Piping Plover - Develop and test new predator management techniques to protect nests and chicks; Develop and test conditioned aversion techniques; Extend testing of artificial coyote territories to exclude red foxes; evaluate threats from ghost crabs and develop appropriate control techniques; Develop and test electric fences.	4	6
Piping Plover -analyze population trends and productivity rates to monitor plover survival rates.	7	6
Piping Plover - Determine temporal distribution of plover mortality.	7	6
Piping Plover -Develop a metapopulation model that will estimate extinction probability for the Atlantic Coast piping plover population.	7	6
Piping Plover - Estimate effective population size for the Atlantic Coast piping plover population.	7	6
Piping Plover - Develop safe techniques for marking plovers.	7	6
Piping Plover - other nesting locations in need of identification for potential nomination as IBAs	1, 7	31

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Red Knot - The collapse of certain shorebird populations, including the red knot, is certain without a severe reduction in horseshoe crab harvests in the Northeast states. The Atlantic States Marine Fisheries Commission should be encouraged to substantially reduce horseshoe crab harvests, especially for bait, until studies have determined a sustainable level of harvest for the species.	14	24
Red Knot - It is critical that a collective regional approach that adequately protects red knot food resources be taken without delay in regard to this issue to prevent the collapse of the entire flyway of red knots and sanderlings.	21	24
Red Knot - Ongoing monitoring programs for red knots in critical areas of concentration are needed. All monitoring programs should be coordinated regionally through the National Shorebird Monitoring program.	7, 21	24
Common Loon -Wintering areas along coast need protection from oil spills, entanglement and pollutants. (MANEM working Group)	9	1
Common Loon - Breeding conservation programs and monitoring/protection of nesting sites in areas of human recreation are essential. (MANEM working Group)	17	1
Glossy Ibis – maintain/enhance populations on 5 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Chimon Island, Duck Island, Ram Island, Shea Island, Tuxis Island)	7	1
Glossy Ibis - Wetland preservation is critical for this species (MANEM Working Group)	1	1
Great Egret – Maintain/enhance populations on 8 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Charles Island, Chimon Island, Cockenoe Island, Duck Island, Great Captain Island, Ram Island, Shea Island, Tuxis Island)	7	1
Great Egret - Species Responds well to restoration of wetland habitats.	1	1
Great Egret - Need to improve monitoring to determine population status. (MANEM Working Group)	7	1
Great Egret – maintain/enhance populations at 8 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Charles Island, Chimon Island, Cockenoe Island, Duck Island, Great Captain Island, Ram Island, Shea Island, Tuxis Island)	7	1
Great Egret - Populations respond well to the protection of nesting and foraging sites and wetland restoration. (MANEM Regional Working Group)	1, 4, 6	1
Green Heron - Maintain/enhance populations on 8 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Chimon Island, Duck Island, Great Meadows, Lewis Island, Ram Island, Shea Island, Sumac Island, Tuxis Island)	7	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Green Heron - Primary concern is conservation and management of wetlands and should involve specie's foraging/habitat needs.	1	1
Green Heron - Some man-made water bodies have created suitable artificial habitat, such as reservoirs, water marshes used for mosquito control, and dredged material islands. (MANEM Working Group)	1, 2	1
Little Blue Heron – maintain/enhance populations on 4 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Chimon Island, Cockenoe Island, Great Captain Island, Shea Island)	7	1
Little Blue Heron - Prohibit trespassing into heron colonies and surrounding buffer zones, especially during the breeding season. (MANEM regional working group)	6	1
Great Blue Heron - Significant (25+ Pairs) nesting areas in need of identification for potential nomination as IBAs.	7	31
Snowy Egret - Renewed need for monitoring and research due to decreasing populations across part of range	7	1
Snowy Egret - responds well to protection of nesting and foraging sites and wetland restoration. (MANEM Regional Working Group)	1, 6	1
Snowy Egret – maintain/enhance population at 8 islands that have been surveyed for the Waterbird Monitoring Partnership over several years (Charles Island, Chimon Island, Cockenoe Island, Duck Island, Great Captain Island, Ram Island, Shea island, Tuxis Island)	7	1
Black Skimmer - Protection of suitable breeding sites is crucial, especially considering the expansion of human populations and their attraction to coastal areas	17, 20	1
Black Skimmer - Large colonies can be protected by restricting development, prohibiting the use of recreational vehicles in nesting areas, and through educating the public.	17, 19, 20	1
Double-crested Cormorant – need research to establish hypothesized impacts on other birds, such as direct interspecific competition for nests and nest sites and habitat degradation	7	1
Double-crested Cormorant - To reduce impacts primarily to fisheries, aquaculture, vegetation and other colonial waterbirds, a large number of techniques have been developed or proposed. These techniques utilize lethal and non-lethal measures and may be used at local, regional or population levels.	13, 14	1
Herring Gull – predator control efforts appear ineffective on large scale, but have been successful in smaller colonies	4	1
Mute Swans - Partner with the Atlantic Flyway to manage adverse effects (BCR 30 workshop)	21	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Pied-billed Grebe - Surveys to accurately assess population abundance, distribution, and trends are needed. Effective standardized surveys should be coordinated region-wide to monitor population trends and habitat quality and availability, and should be conducted during the peak nesting season. Surveys may be readily justified if coordinated with surveys of other marshbirds of management concern. Surveys every 2-3 years should be conducted to provide regional baseline distribution and abundance data. Follow-up surveys should be conducted every 5 years thereafter.	7	23
Pied-billed Grebe - Detailed studies of the vegetative composition of pied-billed grebe habitat are needed, along with studies of water levels, water quality, and minimum wetland area associated with species occurrence during nesting and migration.	7, 8	23
Pied-billed Grebe - The effects of the invasion of phragmites and purple loosestrife on the species should be evaluated.	3	23
Pied-billed Grebe - The effects of diseases, parasites, contaminants, and weather also should be investigated, particularly focusing on contaminant levels in pied-billed grebes and their eggs in agricultural and industrial areas.	10	23
Pied-billed Grebe - Major migration stopover areas should be identified and the over-wintering habitats and biology of the species studied.	7	23
Pied-billed Grebe - Preservation of relatively large (greater than 10 ha) wetlands with an interspersed of dense, robust emergents, submergent vegetation, and open water is the most urgent management need for the species in the Northeast.	1	23
Pied-billed Grebe - Breeding habitat needs to be monitored and protected from contamination, siltation, and eutrophication.	8, 9	23
Pied-billed Grebe - Managers should periodically reverse habitat succession in a rotational sequence to maintain suitable habitat for nesting birds. Creation of nesting habitat may be required to restore viable nesting populations.	2	23
Pied-billed Grebe - The management of impoundments for nesting birds should be considered. On wetlands managed for waterfowl by state and federal agencies, minor alterations to existing management schemes could improve nesting habitat for the pied-billed grebe. This includes retaining portions of dense stands of normally burned, cut, or flooded cattail and bulrush, and maintaining stable water levels during nesting season to prevent flooding of nests and predator access.	1, 2	23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Pied-billed Grebe - Promoting the establishment and growth of floating-leaved and submergent vegetation improves habitat for the species, and the manipulation of water levels provides a cost-effective method for establishing these dense stands of emergent vegetation while retaining open-water areas.	1, 2, 8	23
Pied-billed Grebe - nesting areas and nesting areas for other state-listed wetland nesting species in need of identification for potential nomination as IBAs	7	31
Pied-billed Grebe - Complete drying during wetland drawdowns should be avoided to prevent die-offs of dragonflies and fish. However, the presence of carp in grebe habitat should be discouraged, as they may significantly lower the availability of food supply for grebes and other waterbirds.	8	23
Pied-billed Grebe - Recreational activities, particularly involving motorboats, should be excluded from nesting areas during the breeding season.	17	23
Pied-billed Grebe - Monitoring programs should accompany any management activities to assess the effectiveness of techniques.	7	23
Harlequin Duck - Coordinated regional support should be directed to monitoring the status of winter populations of harlequin ducks where they occur in the Northeast, particularly in Maine and Rhode Island, and in perfecting survey and tracking techniques. Studies are needed on the movements, behavior, and habitat use of wintering birds, and should be coordinated, tracked, and supported on a regional level. Very little is known about the productivity of populations, and studies are ongoing in Maine to determine winter survival. Efforts to safeguard, monitor, and maintain habitat quality in that state should be supported.	21	16
American Bittern - Conduct surveys to gather population numbers and distribution.	7	1
American Bittern - Preservation of priority saltmarsh and freshwater wetland habitats where species occurs.	1	1
American Bittern - Protection from chemical contamination and pollution.	9	1
American Bittern - Increase populations at protected/managed sites.	7	1
American Bittern - Surveys [using standardized methodologies] should be conducted annually for 2-3 years to provide baseline data on population distributions and abundance. Repeated surveys every 3-5 years thereafter should assess population trends.	7	7
American Bittern - Studies are needed to determine breeding biology, diet, home range, mating systems, ability to reneest, sources and rates of mortality in adults, juveniles, nestlings, and eggs, and juvenile dispersal patterns and philopatry.	7	7
American Bittern - Migration routes, major stopover sites, and overwintering areas need to be identified.	7	7

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
American Bittern - The effects of contaminants, parasites, disease, predation, water pollution, acid rain, human disturbance, habitat alteration, and severe weather on populations should be studied.	9, 10, 17	7
American Bittern - The conservation of larger than 10 ha high quality, early-successional wetland habitat with dense growth is the most urgent management need.	1	7
American Bittern - Wetland management strategies should be developed to benefit bitterns at state and federal wildlife refuges and management areas.	1	7
American Bittern - Rotating dense, woody riparian habitat may provide visual barriers from human disturbance during nesting and a buffer against upland runoff of silt, pesticides and other contaminants.	1, 2	7
American Bittern - Complete drawdowns of impoundments where this bird occurs should be avoided so that prey species are conserved for the following season. Slow drawdowns mimicking natural water patterns should be used to create favorable water levels less than 10 cm deep for foraging.	8	7
American Bittern - Liming and fertilizing dikes and adjacent fields should be considered to increase the productivity and raise the pH of wetlands, and the control of purple loosestrife and phragmites infestations may improve habitat quality.	15	7
American Bittern - Habitat requirements should be determined and subsequent habitat manipulations or alterations evaluated, including vegetative characteristics, water quality, and minimum area used by nesting, migrant, and overwintering birds.	7	7
American Bittern - Protect wetlands from drainage through conservation easements, land purchases, tax incentives, management agreements, continuation of the Wetland Reserve Program, and enforcement of wetland-protection regulations	1, 19	30
American Bittern - Maintain a complex of wetlands of sufficient size (wetlands 20-30 ha in size up to 180 ha) to provide habitats at various stages of succession. American Bitterns occurred in wetlands ranging in size from 3 to 182 ha.	1	30
American Bittern - Protect wetlands from siltation, eutrophication, chemical contamination, and other forms of pollution.	8, 9	30
American Bittern - Maintain water levels at <61 cm throughout the breeding season (April-August). Avoid complete drawdowns before mid-August. During molting, bitterns need relatively deep, stable waters to provide adequate food and protection from predators. Use slow drawdowns to mimic natural wetland succession.	8	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
American Bittern - If stock ponds are a part of a management plan, manage for growth of emergent vegetation. American Bitterns prefer semi-permanent wetlands or wetlands with open water in the center, a band of emergent vegetation around the periphery, and idle grassland in the adjacent uplands.	8	30
American Bittern - Maintain a wide vegetative margin around wetlands to protect breeding habitat and to deter nest predators. To maintain tall, dense, upland vegetation, disturbance (e.g., mowing, burning, and grazing) should not occur more often than every 2-5 yr.	1	30
American Bittern - Although American Bitterns nested only in idle grasslands, the twice-over deferred rotation grazing system may be the best grazing system in terms of providing overall bird nesting cover in uplands.	1	30
American Bittern - Encourage adoption of no-tillage or minimum-tillage practices instead of conventional-tillage (annual) practices, so that breeding habitat is undisturbed during the nesting season	15	30
Willet - Provide a diversity of wetlands. Willets use wetlands of widely varying types and salinity, and may need to use larger, more permanent, wetlands during droughts or in late summer.	1	30
Willet - Protect wetlands from drainage and restore drained wetlands.	1, 2	30
Willet - Provide native grassland habitat for upland nesting and foraging.	1	30
Willet - Protect wetland and grassland habitats such that they are extensive enough to support Willet territories, which averaged 44.3 ha. Willets were not found in small (<100 ha) blocks of wetland and grassland habitat. Areas also must be large enough to provide both grassland habitat and a diverse range of wetland types and sizes	1	30
Willet - Burning, mowing, and grazing can be used to provide areas of shorter, sparser vegetation in uplands and wetlands. Fall burning or mowing of upland sites and wetland edges can produce suitable cover for the following spring. Moderate to dense regrowth in burned areas may be too dense for nesting, but may provide the denser, taller cover used by broods.	1, 2	30
Willet - Choose a rotational grazing system, such as twice-over deferred grazing, over a season-long grazing system. Willets prefer previously grazed areas that are idle during the current breeding season. Delay grazing until late May to early June when implementing a rotational grazing system; grazing should be delayed until mid-June when implementing season-long grazing.	1, 2	30
Willet - Protect grasslands from tilling. Encourage no-tillage and minimum-tillage practices on cropland	15	30
Willet - Newly-developed livestock or surface-mine impoundments should have minimum parameters of 0.6 ha surface area, 40% area in shallow water (≤ 1 m deep), 1500 stems/m ² vegetation density in shallow areas, 0.6 mg/L nitrogen content, 0.07 mg/L phosphorus content, and a well-developed shoreline.	15	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Rail - Conduct studies of productivity and survival across the planning unit to understand factors regulating population size and persistence. (PIF)	7	1
Rail - Conduct research on abundance and distribution (MANEM Working Group and BCR 30 workshop)	7	1
Clapper Rail - Continued implementation of wetland protection laws is the most effective management technique for this species. (MANEM working Group)	1	1
Clapper Rail - Tidal restoration and open-marsh water management would also be necessary and translocation to increase genetic variation of certain species has also been shown to be beneficial. (MANEM working Group)	1, 2	1
Sparrow - Conduct studies of productivity and survival across the planning unit to understand factors regulating population size and persistence. (PIF)	7	1
Saltmarsh Sharp-tailed Sparrows - Restore high marsh areas that have been flooded for impoundments in order to provide additional habitat (PIF)	1, 2	1
Saltmarsh Sharp-tailed Sparrow - Protecting all remaining habitat, especially the largest patches, should receive high conservation attention.	1	1
Saltmarsh Sharp-tailed Sparrow - Coordinated regional coastal wetlands protection is key to the survival of this species. Such protection should include the maintenance and monitoring of large, unfragmented corridors of high-quality saltmarsh.	1, 21	25
Saltmarsh Sharp-tailed Sparrow - Management plans should be developed from a regional perspective with the goal of maintaining stable and secure breeding populations along the entire northeast Atlantic Coast.	21	25
Saltmarsh Sharp-tailed Sparrow - On a local level, sparrow habitat should be protected from haying and burning, though control of <i>Phragmites australis</i> may be required.	3	25
Saltmarsh Sharp-tailed Sparrow - Increased efforts at surveying, monitoring distribution and abundance, and determining population trends of the species are needed. Survey information is needed to determine the status of wintering populations in the region, and a regional standardized inventory method should be developed. In Maine, studies have been initiated to develop new survey and monitoring techniques for this species (contact Thomas P. Hodgman).	7	25
Saltmarsh Sharp-tailed Sparrow - The factors that regulate populations are largely unknown and the demographics of populations need to be determined.	7	25
Saltmarsh Sharp-tailed Sparrow - Managers would benefit from studies addressing the effects of marsh restoration through the plugging of mosquito control ditches.	1, 2, 6, 7	25

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Saltmarsh Sharp-tailed Sparrow - additional nesting areas in need of identification for potential nomination as IBAs.	7	31
Grasshopper Sparrow - increase current population estimates of 35 pairs to 70 pairs and manage for optimal habitat objective 280 hectares of suitable habitat necessary to support 70 pairs at an average density of 4 hectares per pair.	7	1
Grasshopper Sparrow -Acquisition and management of patches of potential grassland habitat greater than 100 acres would benefit population recovery attempts, particularly if such attempts are made in the proximity of historic populations, or in areas with dry soil conditions. Plantings of native, warm-season grasses in grassland habitats would be most effective in restoration efforts for Grasshopper Sparrows, as these types of grasses facilitate the optimal conditions for this species' nesting. Where possible, airport properties, and large, capped landfills should be managed for this and other grassland nesting bird species. Any efforts at population recovery for Grasshopper Sparrows would benefit a wide range of grassland-nesting bird species.	1, 2, 19	3
Grasshopper Sparrow - 10 sites of 250 acres each, for a total of 2,500 acres, for natural managed grassland habitat in Connecticut	7	3
Grasshopper Sparrow - Provide areas of suitable habitat large enough to support breeding populations, the minimum area needed to support a breeding population may be ≥ 30 ha.	1	30
Grasshopper Sparrow - Shape, as well as area, of management units must be taken into consideration; perimeter-area ratio strongly influenced occurrence.	1	30
Grasshopper Sparrow - Reduce amount of grassland edge near suburban interfaces.	2, 20	30
Grasshopper Sparrow - Treat portions of large areas on a rotational schedule to provide a mosaic of successional stages; on areas >80 ha, annually treated (burned, mowed, or grazed) subunits should be ≥ 30 ha, or about 20-30% of the total area.	2	30
Grasshopper Sparrow - Treat small, isolated areas as part of a larger mosaic, ensuring a variety of successional stages. Burn (or possibly mow or graze) ≤ 50 -60% of small, isolated fragments at a time and no more than 20-30% of tallgrass prairie fragments annually in a rotational manner.	2	30
Grasshopper Sparrow - create or maintain patches of relatively sparse, grass-dominated vegetation resembling old (>8 -10 yr since planted) hayfields. Plant bunch grasses on disturbed sites; bunch grasses allow openings in vegetation that facilitate foraging	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Grasshopper Sparrow - discourage woody vegetation by disturbing (mowing, burning, or grazing) idle grassland. Remove woody vegetation within and along the periphery of fragments because it may attract predators and reduce nest success.	2	30
Grasshopper Sparrow - Maintain open grassland by burning habitat once every 2-4 yr. Monitor population responses to burning, especially during unusually dry years. Treatment schedules should be adjusted during droughts as burning may reduce above-ground productivity to levels unacceptable to birds.	2	30
Grasshopper Sparrow - Eastern grasslands can be burned in late winter to prevent encroachment of shrubs. Disturbance should occur prior to or following the breeding season and should occur every 2-3 yr	2	30
Grasshopper Sparrow - mowing on a 1-3 yr rotation provided vegetation heights (<30 cm) suitable for Grasshopper Sparrows. Interval between management depends on grassland type, as mesic prairie regains litter more rapidly (1-3 yr) than dry prairie (4-6 yr), and sooner in southern than northern prairie.	2	30
Grasshopper Sparrow - Graze areas of tall, dense vegetation to provide diverse grass heights and densities. A rotational system may be most beneficial. Graze native, tallgrass CRP fields to improve the breeding habitat by reducing vegetative height, and by increasing canopy and forb coverage and invertebrate biomass. Use various grazing systems (e.g., early-season, deferred [after 15 July], and continuous grazing of native grasslands, and spring-grazing [late April to early June] of tame grasslands) to maintain a mosaic of grassland types.	2	30
Grasshopper Sparrow - In cultivated areas, use no-till/minimum-till methods when possible	15	30
Grasshopper Sparrow - Granby/East Granby site for potential nomination as IBAs	7	31
Grasshopper Sparrow - Double the statewide population.	7	32
Vesper and Grasshopper Sparrow -Ten sites of at least 500 acres in size are recommended to ensure 5 populations of each species, for a total of 5,000 acres of managed natural grassland habitat	7	3
Vesper Sparrow - 10 sites of 50 acres each, for a total of 500 acres, for natural managed grassland habitat in Connecticut	7	3
Vesper Sparrow -Management of areas of grasslands at the edges of agricultural land, in the coastal zone, or embedded within very large grassland complexes would be the most successful efforts for any recovery attempt. In the Connecticut River Valley in Massachusetts, Vesper Sparrows nest along the edges of potato fields and sometimes tobacco fields, as well as in the weedy areas around barns or field edges. Efforts should be undertaken to survey some of those habitat types in Connecticut to determine if any Vesper Sparrows may still breed in the state, as the discovery of additional breeding locations might mitigate against the need to manage specifically for this species.	2, 15	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Vesper Sparrow - If sagebrush must be controlled by burning or chaining, do so in the spring before breeding territories are established or in late summer or early fall after birds have left the area.	2	30
Vesper Sparrow - Treat large areas in small blocks over several years. Leave some sagebrush to serve as perches. Burn or mow roadsides every 3-5 yr to maintain vegetation quality.	2	30
Vesper Sparrow - To reduce nest losses, mow roadsides only in early spring or late summer.	2	30
Vesper Sparrow - Encourage farmers to retain fence lines along roadsides, especially in areas where forbs are sparse, to serve as perches.	15	30
Vesper Sparrow - Delay spraying pesticides and mowing in CRP until after July to avoid the peak nesting period. Delay mowing grassed waterways in croplands until late August to avoid disturbing nesting birds.	15	30
Vesper Sparrow - Waterways may serve as refuges because other haylands are mowed earlier in the season. Mow every 3-4 yr to maintain grass vigor. Do not burn waterways in the fall. Burning would have to be delayed until after fall harvest, which would preclude any regrowth of the vegetation. Encourage the growth of forbs in waterways.	2	30
Vesper Sparrow - Maintain fencerows adjacent to cropland. Removal may reduce the use of corn and soybean fields by Vesper Sparrows. Near cropland, increase the proportion of fencerows that consist of both herbaceous and shrubby vegetation.	2	30
Vesper Sparrow - To increase productivity of Vesper Sparrows in crop fields, leave more corn residue and reduce the number of mechanical field operations. Low nesting success early in the breeding season was mostly attributed to nest destruction by mechanical field operations such as seedbed preparation with a rotary hoe or cultivation.	15	30
Vesper Sparrow - Adopt no-tillage practices to enhance Vesper Sparrow productivity. A decrease in tillage operations would decrease the number of nests destroyed by tillage. Reduced-tillage farming provides more foraging opportunities than conventional-tillage methods.	15	30
Vesper Sparrow - Use no-tillage or minimum-tillage methods to retain crop residue that may increase nesting success by providing more nest concealment cover and retain waste grain on the surface of fields for birds to use. However, the use of herbicides in no-tillage or minimum-tillage practices decreases weed-seed density.	15	30
Vesper Sparrow - If a system of strip intercropping must be used, decrease the number of passes made by farm machinery through strips or increase time between passes to 3.5 wk to allow the completion of nesting cycles.	15	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Vesper Sparrow - As an alternative to mechanical means of weed control, apply herbicides minimally by spot spraying. Limit pesticide use in areas where Vesper Sparrows forage. Use only rapidly degrading chemicals of low toxicity at the lowest rates possible.	15	30
Vesper Sparrow - Avoid pest outbreaks by maintaining range in good condition. Overgrazed and drought-affected areas tend to be more prone to insect outbreaks.	15	30
Vesper Sparrow - Plant shrubs on recontoured and reseeded strip mines to make reclaimed areas more attractive.	2	30
Vesper Sparrow - To facilitate the expansion of shrubby areas, maintain areas of shrubs along roadsides, between mine spoils, and around equipment and storage buildings during mining and reclamation operations.	2	30
Savannah Sparrow - 26 sites of 25 acres each, for a total of 650 acres, for natural managed grassland habitat in Connecticut	7	3
Savannah Sparrow -Because this species is more of a grassland habitat generalist than any of the other grassland nesting species found in the state, any efforts to increase or manage for grassland habitat will benefit this species.	1	3
Savannah Sparrow - Existing nesting locations should continue to be fully documented and protection and management of such areas encouraged.	7	3
Savannah Sparrow - Management efforts for Savannah Sparrows should include delaying mowing until at least the end of July to prevent nest destruction.	2	3
Savannah Sparrow - Promote management or enhancement activities that increase the amount of contiguous grassland habitat to benefit Savannah Sparrows.	2	30
Savannah Sparrow - Reduce amount of grassland edge near suburban interfaces.	2, 20	30
Savannah Sparrow - Remove woody vegetation within and along the periphery of grassland fragments to discourage predators that may use woody vegetation as travel corridors and to enlarge the amount of interior grassland	2	30
Savannah Sparrow - Acquire large grassland tracts and minimize edge effects through reduction of woody vegetation along edges and within.	1	30
Savannah Sparrow - In small grasslands, adjacent woody habitats may allow edge and woodland predators to penetrate interior grassland areas.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Savannah Sparrow - Aim grassland restorations at benefiting bird species most sensitive to habitat fragmentation; restorations should be ≥ 50 ha, preferably > 100 ha. Where grassland restorations ≥ 30 ha are not possible, establish several small grasslands, 6-8 ha minimum size, within 0.4 km of each other, and using adjacent grassland habitats (e.g., pasture, hayland, waterway) as corridors among tracts.	2	30
Savannah Sparrow - Avoid disturbing (e.g., burning, mowing, moderate or heavy grazing) suitable habitat during the breeding season, approximately 1 May to 1 August. Treatments in nesting habitat should be delayed until after 1 August to prevent destruction of fledglings and renesting females. Burn grasslands managed for breeding bird habitat in early spring (March to April) or late fall (October to November).	2	30
Savannah Sparrow - In grasslands ≥ 50 ha, burn 25-30% annually. In mixed-grass prairie, burn every 5-7 yr. When possible (e.g., on federal lands or through cooperation with private landowners), delay mowing of hayfields until mid-July, which would allow many birds to raise at least one brood in years with normal breeding phenology; mowing should be delayed further if nesting is delayed by inclement spring weather.	2	30
Savannah Sparrow - When mowing must be done during the breeding season, divide large fields, mowing only half each year, or mow individual fields every other year to provide refuge for fledglings.	2	30
Savannah Sparrow - On airports not large enough to provide habitat for nesting birds (e.g., where all of the grassland available must be mowed to meet Federal Aviation Administration standards), mow grass short enough (< 4 cm) to discourage nesting. This may cause birds to select alternative areas where nesting success would be higher.	2	30
Savannah Sparrow - Light grazing (leaving $\geq 40\%$ vegetation cover ≥ 25 cm tall) can be used to create the intermediate vegetation height and density preferred	2	30
Savannah Sparrow - study nest timing; More precise information on egg laying and fledging dates are needed so that conservationists can work with farmers to develop mowing regimes that would be both economically feasible and advantageous to the birds. Currently no funding exists to support such a study.	7	3
Seaside Sparrow - Maintain the current statewide population.	7	32
Bobolink - study nest timing; More precise information on egg laying and fledging dates are needed so that conservationists can work with farmers to develop mowing regimes that would be both economically feasible and advantageous to the birds. Currently no funding exists to support such a study.	7	3
Bobolink -Efforts should concentrate on maintaining current population levels, enhancing breeding productivity, and ensuring that enough acreage of late-harvested hayfields are provided.	7	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bobolink - Educational programs should be made available to local land trusts and other land protection groups to make them aware of the aesthetic and conservation benefits a nesting colony of Bobolinks can bring to a parcel of open space. Education would also be necessary to inform these groups of effective practices for management of Bobolinks, and programs that would help pay the costs of mowing such locations would be beneficial.	19	3
Bobolink - 130 sites of 25 acres each, for a total of 3,250 acres, for natural managed grassland habitat in Connecticut	7	3
Bobolink - Regardless of geographic location, avoid disturbing (e.g., haying, burning, moderately or heavily grazing) nesting habitat during the breeding season, approximately early May to mid-July. Treatments can be done in early spring (several weeks prior to the arrival of adults on the breeding grounds) or in the fall after the breeding season (Martin and Gavin 1995).	2	30
Bobolink - Delay treatments until late July or August to protect fledglings and late-nesting females. Mowing accounted for 51% of Bobolink nest losses in a New York hayfield.	2	30
Bobolink - Create large habitat patches (>10-30 ha) and minimize woody edges whenever possible to decrease Brown-headed Cowbird brood parasitism.	2	30
Bobolink - Use a rotating treatment schedule on several nearby prairie fragments to make a variety of successional stages available. Adjacent patches of alternative habitat provide refuge for fledglings to escape from mowed areas and for late-nesting females.	2	30
Bobolink - Create or maintain patches of relatively sparse, grass-dominated vegetation resembling old (>8 yr since planted) hayfields. Scattered forbs (e.g., clover [Trifolium spp.]) should be encouraged for nest-site cover. Bobolinks preferred haylands with high grass-to-forb ratios and avoided haylands with high legume-to-grass ratios.	2	30
Bobolink - Burn large areas (>80 ha) using a rotational system. Subunits of ≥ 30 ha in area, or about 20-30% of the total area, should be treated in a year. In small, isolated prairie fragments, burn $\leq 50-60\%$ of the total area at a time.	2	30
Bobolink - Mow or burn patches every 2-3 yr to prevent excessive encroachment of woody vegetation. In most years, delaying mowing until the end of June may allow young Bobolinks time to fledge.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bobolink - Graze at moderate levels to provide diverse grass heights and densities in areas where the average height of vegetation is 20-30 cm. Graze using a rotational system of two or more grazing units. This will increase the variation in grass heights and densities within and between units. To maintain plant vigor, do not graze warm-season grasses in tallgrass prairie to a height of <25 cm during the growing season.	2	30
Bobolink - Increase the statewide population from 7,900 to 12,000 individuals.	7	32
Henslow's Sparrow -Recovery in Connecticut is unlikely, due to the long distance from any current nesting areas and the dramatic population declines of the eastern subspecies in recent years. Large grasslands managed with a mosaic of grassland subtypes have the best chance to attract this species. Any nesting attempts or occurrences of this species in Connecticut should be fully documented.	7	3
Henslow's Sparrow -This species has very specific nesting requirements, and rotational mowing and burning of habitat sites to increase grassland productivity should be encouraged except during nesting season (mid-April through mid-August).	2	17
Henslow's Sparrow - The conversion of grassland habitat to native warm season grasses also is encouraged, and should be targeted on public lands.	2	17
Henslow's Sparrow - Low-intensity grazing has been found to be beneficial under controlled conditions during the nesting season, and the effects of a combination of management techniques on stable populations could benefit from further research.	2	17
Henslow's Sparrow - A minimum of 30 ha or more of contiguous grassland should be preserved at any site.	1	17
Henslow's Sparrow - More research is needed to determine the factors surrounding site and mate fidelity, annual mortality, and reproductive success rates.	7	17
Henslow's Sparrow - The role of litter depth in habitat selection should also be investigated in the Northeast.	15, 16	17
Henslow's Sparrow - Breeding populations should be monitored annually in localized areas where the species occurs.	7	17
Henslow's Sparrow - This species is not well covered by standard population monitoring programs. There is a need to invent new techniques and make a targeted effort to inventory and monitor these birds.	7	17
Henslow's Sparrow -Because of the general rarity of this species and its disturbing decline range-wide, it may be beneficial to review population status from a regional perspective, and establish state listings based on those findings	7, 21	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Henslow's Sparrow - Where possible, provide ≥ 30 ha of contiguous grassland. If contiguous management units are not available, provide a complex of smaller units located near enough to one another to facilitate colonization from adjacent territories in available habitat.	2	30
Henslow's Sparrow - Create large, grassy areas near small prairie fragments; small prairie fragments can support higher densities of Henslow's Sparrows if surrounded by other grassland habitat.	2	30
Henslow's Sparrow - Remove woody vegetation within and along the periphery of grassland fragments to discourage predators that may use woody vegetation as travel corridors and to enlarge the amount of interior grassland.	2	30
Henslow's Sparrow - Never burn, mow, or otherwise disturb an entire area in one breeding season because disturbance reduces available habitat for one or two growing seasons.	2	30
Henslow's Sparrow - Implement a rotational disturbance regime to maintain grassland habitat. In order to avoid destruction of nests, conduct management treatments before birds arrive in the spring (15 April) or after the young have fledged (15 September).	2	30
Henslow's Sparrow - Provide dense and moderately tall (>30 cm) grassy vegetation	2	30
Henslow's Sparrow - Removal of woody vegetation is needed when it becomes taller than the fully grown herbaceous vegetation. Prevent encroachment of woody vegetation with periodic prescribed fire with a rotational burning program in which 3-4 adjacent tracts are burned on a 3-4 yr cycle; incidental observations suggest that each patch should be at least 20-30 ha, annually burn one-third to one-half of a management area to maintain suitable habitat.	2	30
Henslow's Sparrow - Burning is preferred over haying, because vegetation recovers more quickly after burning than haying. Prescribed burns should be conducted in early spring (March to early April) or late fall (October and November). Burn once every 5-6 yr or mow every 4-5 yr to allow vegetation to recover between disturbances to provide suitable habitat while keeping succession in check.	2	30
Henslow's Sparrow - Provide idle or lightly grazed grasslands. Light grazing was defined as grazing pressure that left $>40\%$ vegetative cover at 25.	2	30
Henslow's Sparrow - Grassland restoration areas should be ≥ 50 ha and preferably >100 ha in size.	2	30
Field Sparrow - Burning should be used to prevent encroachment of woody vegetation, but management practices that completely remove woody vegetation should be avoided. Burning after territories have already been established does not appear to cause them to abandon their territories, but should be avoided before territories have been established, approximately March to early April.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Field Sparrow - Beneficial manipulations of forested riparian habitats include reducing woody vegetation to narrow strips, partially removing woody canopy, and thinning shrubs and saplings.	2, 16	30
Field Sparrow - Protect existing prairie remnants. On prairie fragments >80 ha, burning should be conducted on a rotating schedule with 20-30% of area treated annually. Small, isolated prairie fragments should not have more than 50-60% of total area burned at a time, and where several small prairie fragments are present, a rotating schedule also can be implemented to provide adjacent burned and unburned areas.	1	30
Field Sparrow - Collaborate with private landowners to maintain suitable breeding habitat. Mowing should be delayed until late August or early September to prevent destruction of nests and young; however, mowing should not occur later than mid-September, as vegetation will not have time to recover before the winter and following spring. Minimize tillage, because conventional tillage leaves little or no crop residue on the soil surface. Reduced tillage allows 15-30% of crop residue to remain, whereas conservation tillage allows $\geq 30\%$ of crop residue to remain.	1, 19	30
Field Sparrow - Double the statewide population from 4,400 to 8,800 individuals.	7	32
Eastern Meadowlark -130 sites of 25 acres each, for a total of 3,250 acres, for natural managed grassland habitat in Connecticut	7	3
Eastern Meadowlark - Promote greater forb density and diversity in managed grasslands (e.g., CRP, WPAs) to improve overall habitat quality and provide food sources such as insects. This may be accomplished by allowing natural succession to proceed or by interseeding forb species in grassland plantings.	2	30
Eastern Meadowlark - Limit the encroachment of woody vegetation. Remove woody vegetation within and along the periphery of grassland fragments to discourage predators that may use woody vegetation as travel corridors and to enlarge the amount of interior grassland.	2	30
Eastern Meadowlark - Maintain a complex of burned and unburned habitats to provide a variety of grassland habitat types. Conduct prescribed burns in late spring on warm-season grasses to eliminate or reduce competition by cool-season grasses and weeds. Burn patches >80 ha on a rotation schedule, with 20-30% of area treated annually. Small, isolated patches should not have more than 50-60% of the total area burned at a time. Where several small patches are present, a rotating schedule also can be implemented to provide adjacent burned and unburned areas.	2	30
Eastern Meadowlark - Burning is preferred over haying, because vegetation recovers more quickly after burning than after haying. Discourage grazing on burned grasslands to allow regrowth of herbaceous vegetation.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Eastern Meadowlark - Work to create a mosaic of burned, unburned, and grazed areas. Burn tallgrass prairie every 3-5 yr and mow only at intervals of >3 yr. Burning is particularly recommended for areas where grazing is not used as a management tool. In general, do not idle tall prairie grasses >1 yr. Use burning as an alternative to mowing in CRP fields to periodically invigorate vegetation.	2	30
Eastern Meadowlark - Do not conduct burns annually. Reduce frequency of burning from annually to every 2-3 yr on CRP fields or every 3-5 yr to reduce vegetation that has become too dense. Cool burns are optimal because some bunchgrasses and forbs will remain after the burn.	2	30
Eastern Meadowlark - Provide periodic disturbances such as haying or grazing to increase floristic and structural diversity of seeded-native CRP, making them more attractive to meadowlarks.	2	30
Eastern Meadowlark - Optimal mowing frequency may be every 3-5 yr in late summer, involving some kind of raking to reduce the litter layer.	2	30
Eastern Meadowlark - Delay burning and mowing within the breeding season to enhance suitable nesting habitat or to prevent nest destruction.	2	30
Eastern Meadowlark - If management is required to control weeds, use spot mowing and spot spraying after 15 July to reduce nest destruction.	2	30
Eastern Meadowlark - Allow moderate grazing where the average height of currently grazed grassland vegetation is 20.3-30.4 cm to enhance both avian species and plant height. To maintain plant vigor, do not graze warm-season grasses to <25 cm tall during the growing season in tallgrass prairie. Use a rotational system of grazing on two or more grazing units to provide a diversity of plant heights.	2	30
Eastern Meadowlark - Grazing management decisions that attempt to benefit Eastern Meadowlark populations also must consider soil-type/grazing interactions.	2	30
Eastern Meadowlark - Discourage birds from attempting to nest at small, rural airports, which are population sinks. This can be accomplished by lowering the cutter height and mowing more frequently. Few birds nested at vegetation heights of 3.8 cm.	2, 20	30
Eastern Meadowlark - Any of the programs suggested for the recovery of Bobolinks would also benefit Eastern Meadowlarks.	2	3
Eastern Meadowlark - Land managers at areas managing habitats for Eastern Meadowlarks should encourage visitors to stay on mowed paths and to keep their dogs on leashes during the nesting season, since Eastern Meadowlarks are particularly susceptible to human disturbance.	6, 17	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Horned Lark - Programs that encourage fallow agricultural lands, such as the Conservation Reserve Program, could be successful in increasing or stabilizing Horned Lark populations.	15, 19	3
Horned Lark - Efforts should be made to search for additional nesting areas and attempts should be made to manage for this species in these areas.	7	3
Horned Lark - efforts should be made to identify, restore, and manage disturbance from off-road vehicles at open sandplain areas in the Connecticut River Valley since this habitat type generally provides good nesting areas.	17	3
Horned Lark - Efforts to control human disturbance at historical coastal-dune nesting areas may benefit this species. Seven managed nesting locations should be sufficient to allow this species to remain at 1980s population levels	17	3
Horned Lark - Burn in the spring to reduce woody species (Skinner et al. 1984).	2	30
Horned Lark - Burning, mowing, or grazing can be used interchangeably to create short, sparse vegetation that Horned Larks prefer.	2	30
Horned Lark - Control shrub growth in mixed-grass pastures by allowing mowing or. In mesic areas, allow moderate grazing to increase habitat patchiness and bird diversity.	2	30
Horned Lark - When pest management is required, use only rapidly degrading chemicals of low toxicity to nontarget organisms and apply at the lowest application rates possible.	2	30
Horned Lark - Avoid pest outbreaks by maintaining range in good condition. Overgrazed and drought-affected areas tend to be more prone to insect outbreaks.	15	30
Horned Lark - Reduce amount of grassland edge near suburban interfaces.	2, 20	30
Horned Lark - Road construction plans should consider the effects of roads on bird densities in rights-of-way and ≤500 m from rights-of-way.	20	30
Dickcissel - Protect areas (≥10 ha for Illinois grassland) of suitable habitat	1	30
Dickcissel - Shape, as well as area, of management units must be taken into consideration; perimeter-area ratio strongly influenced occurrence.	1	30
Dickcissel - Minimize disturbance to suitable habitat during the breeding season. Adjust timing and type of management according to habitat.	2	30
Dickcissel - allow litter cover to accumulate by burning CRP fields less frequently (i.e., every 3 yr). Litter cover was positively associated with daily nest-survival rate.	2, 15	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Dickcissel - periodic burning in spring may be desirable to rejuvenate growth of warm-season grasses.	2	30
Dickcissel - Prescribed burning in summer or fall or light disking of selected portions of individual fields can maintain mid-successional seral stages and increase coverage of tall forbs.	2	30
Dickcissel - To increase Dickcissel abundance and productivity, avoid conducting grazing and burning or grazing and haying treatments on the same site. Simultaneous burning and grazing may simulate drought conditions, reducing above-ground herbaceous vegetation and decreasing nest-site availability.	15, 2	30
Dickcissel - On privately owned rangelands, work to create a mosaic of sites that are suitable for Dickcissel productivity as well as sites that will benefit cattle production. Burned and grazed sites benefit cattle production, whereas sites that are idle, only burned, or only moderately grazed provide dense herbaceous vegetation preferred by Dickcissels.	2, 15	30
Dickcissel - To enhance the use of grassy edges by Dickcissels, establish grassy filter strips along fields and existing edges and locate hay or small grains near wide grassland corridors.	2	30
Dickcissel - Create large, grassy areas near small prairie fragments; small prairie fragments can support higher densities of Dickcissels if surrounded by other grassland habitat.	2	30
Dickcissel - Burn grasslands and roadsides in blocks on a 3-5 yr rotational basis to maintain vegetation quality. Use prescribed burning in a rotational system to provide a mosaic of habitats. Burn no more than 20-30% of a prairie fragment annually. Burning is preferred to haying, because vegetation recovers more quickly after burning than haying.	2	30
Dickcissel - Mow grasslands and roadsides in blocks on a 3-5 yr rotational basis to maintain vegetation quality. Delay mowing until after the peak nesting period (i.e., until after mid-August), when possible, to improve Dickcissel productivity. However, do not mow later than mid-September in northern regions, because vegetation will not have time to recover before the winter or the following spring.	2	30
Dickcissel - Avoid mowing or eliminating forbs, brush, and hedgerows.	2	30
Dickcissel - To maintain plant vigor in tallgrass prairie, do not graze warm-season grasses to <25 cm during the growing season. Provide areas of tall, dense planted cover, such as that provided in CRP fields or dense nesting cover. Allow retired agricultural fields to undergo secondary succession. However, when succession begins to advance to the point of becoming unsuitable for breeding Dickcissels, implement burning and/or grazing to control the growth of woody vegetation.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Loggerhead Shrike -Because of their relatively high reproductive rates and the seemingly suitable habitat available, there is an excellent potential for recovery of this species if the causes for decline can be identified. However, because of their dangerously low numbers, targeted efforts should be dedicated to surveying and monitoring historical and potential breeding areas annually.	7	19
Loggerhead Shrike - Tracking nesting locations and nesting attempts in all states is worthwhile, not only to identify site-specific problems that may help contribute to the reasons for decline in the species, but to identify and protect vulnerable habitat from loss, alteration, or degradation.	7	19
Loggerhead Shrike - Winter habitat remains poorly studied and information on foraging areas within repeatedly used wintering territories is needed.	7	19
Loggerhead Shrike - Studies are needed to determine the effects of habitat fragmentation and quality in winter range on populations.	7	19
Loggerhead Shrike - The most effective habitat protection will probably require regional land planning tools, such as zoning, special agricultural districts, and agricultural easements, which will help maintain large areas of suitable habitat.	1, 19, 21	19
Loggerhead Shrike - Sites with both regular summer and winter use should be priorities for protection	1	19
Loggerhead Shrike - Landowner contact programs should be implemented as well as potential habitat acquisition opportunities.	19	19
Loggerhead Shrike - Determining the causes of decline remains key to the survival of this species. Studies of reproductive success have not provided the answer, but studying the causes of mortality may be worthwhile.	7	19
Loggerhead Shrike - Further studies targeting the non-lethal effects of pesticides are warranted. Pesticides have not been linked to lower reproductive success, but may be limiting the species' survival in other ways.	9	19
Loggerhead Shrike - Preserve native prairie in breeding and wintering areas; where this is not possible, provide seeded pastures.	1	30
Loggerhead Shrike - Discourage agricultural policies that encourage conversion of prairie to cropland	15	30
Loggerhead Shrike - Protect suitable habitat through incentive programs such as the Conservation Reserve Program, through easements, donations, land trusts, leases, purchases, or through designation of suitable habitat as natural areas.	1, 19	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Loggerhead Shrike - Provide areas of adequate size for breeding Loggerhead Shrikes, taking into consideration that females sometimes mate with more than one male or switch mates. Areas should be large enough to support several average-sized territories (about 2.7-25 ha/territory) of asymmetrical shape.	1	30
Loggerhead Shrike - Maintain low, thick shrubs and trees along fence lines, in abandoned farmyards, and throughout otherwise open pastures and fields	2	30
Loggerhead Shrike - maintain and diversify shelterbelts by incorporating native thorny trees and bushes such as hawthorn, honey locust (<i>Gleditsia triacanthos</i>) and hedge rose (<i>Rosa rugosa</i>) to provide nesting and perching habitat and planting a 2-4 m strip of grass around shelterbelts to increase foraging areas near nest sites.	2	30
Loggerhead Shrike - patchily burned areas provide the high structural diversity preferred by Loggerhead Shrikes, in areas with taller vegetation, implement grazing where pastures provide suitably short vegetation for Loggerhead Shrike foraging.	2	30
Loggerhead Shrike -a few areas of tallgrass should be maintained within pastures as they serve as food reserves for small mammals, which are potential Loggerhead Shrike. In areas with naturally short vegetation, control grazing and mowing to increase areas of taller grass (≥ 20 cm). Although Loggerhead Shrikes prefer to forage in short grass, foraging success may be higher in tallgrass areas, where vertebrate prey abundance is higher	2	30
Loggerhead Shrike - Maintain herbaceous cover, perhaps by burning at a frequency that will prevent woody vegetation from dominating the area, but not completely eliminate it; trimming or manual removal of shrubs and trees may be used to manage woody vegetation, in place of herbicides or frequent mowing.	2	30
Loggerhead Shrike - Linear habitats may be improved by manipulating cover density, planting multiple rows of trees in shelterbelts, adding larger blocks of habitat adjacent to strips of woody vegetation, or planting thorny, native vegetation in fencerows.	2	30
Loggerhead Shrike - Reduce use of biocides when possible to help protect insects and other prey species.	9, 15	30
Upland Sandpiper -Ten sites of at least 500 acres in size are recommended to ensure 5 populations of each species, for a total of 5,000 acres of managed natural grassland habitat	7	3
Upland Sandpiper - 10 sites of 500 acres each, for a total of 5,000 acres, for natural managed grassland habitat in Connecticut	7	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Upland Sandpiper -Land acquisition and management in perpetuity is the key to the recovery of this species. Where possible, airport properties should be managed for Upland Sandpipers. Any attempts to manage for Upland Sandpipers would be most effective on grassland greater than 200 acres, and have a greater chance of success on grasslands larger than 500 acres. Efforts on behalf of this species would also benefit a wide range of grassland-nesting bird species. An ultimate goal of 5 nesting locations would likely ensure the continued presence of this species as a nesting bird in Connecticut.	1	3
Upland Sandpiper - The fact that upland sandpipers have adapted their habitat requirements to utilize airports, reclaimed mine lands, capped landfills, and other human-made landscapes indicate that recovery potential is promising if suitable nesting and brood-rearing habitat is managed and increased.	2	28
Upland Sandpiper - Optimal upland sandpiper breeding habitat contains a mixture of short grass areas for feeding and courtship, interspersed with taller grasses and forbs for nesting and brood cover. Periodic treatment by burning, light grazing, and mowing to remove cover may be desirable to maintain grasslands in the best ecological condition.	2	28
Upland Sandpiper - All haying operations should be restricted until after the chicks have hatched in mid-July. In grazed pastures, cattle should be restricted from sandpiper nesting areas during the egg-laying and incubation periods (1 May-15 July).	2	28
Upland Sandpiper - fencing can protect nests. Fence posts can be constructed to provide display sites for the birds.	6	28
Upland Sandpiper - An education program to help protect nest sites from human and pet disturbance should be launched in sensitive areas.	19	28
Upland Sandpiper - Management for upland sandpipers on airport lands and reclaimed mine lands should be encouraged. Grasses at airfields should be maintained at a height of 20-30 cm over portions of the airfield not directly adjacent to runways or taxiways, and mowing of these areas should be restricted from May through July. Maintenance of taller grasses not directly adjacent to runways provides nesting habitat and discourages large concentrations of other birds, while reducing mowing costs.	2	28
Upland Sandpiper - Grassland management programs have been implemented at Bradley Airport in Connecticut and Westover Air Force Base in Massachusetts.	2	28

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Upland Sandpiper - Regionally coordinated annual and standardized surveys of known or historic upland sandpiper breeding habitat during the breeding and migratory season are necessary to provide information on long-term population trends, to promote protection of breeding sites, and to assess the effectiveness of active management programs.	7, 21	28
Upland Sandpiper - Survey teams should take precautions to reduce the risk of predation induced by human scent at nest sites.	7	28
Upland Sandpiper - Information on regional fledging success, characterization of nesting cover, migration patterns, and habitat requirements during migration is essential to developing and maintaining effective management plans.	21	28
Upland Sandpiper - Maintain large (>100 ha), contiguous tracts of prairie to reduce edge, provide habitat heterogeneity, and to decrease nest depredation. Blocks should be within 1.6 km of each other and be contiguous with grassy habitats (e.g., pasture, hayfields). Shape, as well as area, of management units must be taken into consideration.	2	30
Upland Sandpiper - Maintain native prairie by implementing burning, grazing, or haying treatments, or leaving idle, every 2-3 yr.	2	30
Upland Sandpiper - Allow some blocks of grassland to be undisturbed to serve as nesting cover. Avoid burning, mowing, or plowing during the nesting season. Mowing and spraying of pesticides in CRP should be delayed until after July 1 or later to avoid disturbances during peak nesting and brooding.	2	30
Upland Sandpiper - Provide display perches, such as fence posts, rock piles, or tree stumps.	2	30
Upland Sandpiper - Prevent encroachment of woody vegetation.	2	30
Upland Sandpiper - A complex of fields of different management practices may be necessary to meet Upland Sandpiper needs during the breeding season. Grazed, burned, and hayed fields provide suitable habitat for feeding, loafing, and brood rearing, but undisturbed fields are needed for nesting.	2	30
Upland Sandpiper - Provide a mosaic of habitat types, such as grassland of various heights and densities as well as cropland, to provide for the needs of Upland Sandpiper throughout the breeding season.	2	30
Upland Sandpiper - Annually burn 20-30% of grassland fragments <80 ha. Small fragments should have <50% of their area burned at a time, and, if next to other fragments, should be burned in a rotating manner that allows unburned fragments to be next to burned fragments. Burns should occur from March to early April or October to November.	2	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Upland Sandpiper - Avoid mowing road rights-of-way until late July.	2	30
Upland Sandpiper - Graze at moderate levels to provide diverse grass heights and densities. Graze using a rotational system of two or more grazing units to increase grass heights and densities within and among units.	2	30
Upland Sandpiper - Choose rotational grazing over season-long grazing to provide more undisturbed cover during the nesting season by deferring two or more pastures until mid- to late June. With rotational grazing systems, delay grazing until late May to early June to maintain nest densities as well as to optimize calf performance. Follow stocking rates as outlined by the U.S. Soil Conservation Service (1984)	2	30
Upland Sandpiper - Encourage no-till or minimum-till practices instead of annual tillage practices, so that habitat is undisturbed during the nesting season. Nest productivity is low on annually tilled cropland and former cropland planted to grass/legumes.	2, 15	30
Upland Sandpiper - Encourage adoption of organic farming in cultivated areas, but delay first tillage until late June or early July to prevent destruction of nests.	15	30
Upland Sandpiper - Maintain heterogeneous fields of cool-season, tame grasses that are >5 yr old; to obtain a mixture of forbs and grasses, fields should not be re-seeded until they are 10-12 yr old.	2	30
Upland Sandpiper - Management of seeded grasses includes allowing them to idle, rotary mowing to a height of 15-30 cm on a 3-yr rotation, or burning.	2	30
Upland Sandpiper - Moderate grazing may provide suitable habitat in both native and tame grasses, but more research needs to be done.	2	30
Sedge Wren -Any existing nesting areas should be identified. Attempts to protect such areas and manage habitat for this species on those lands should be encouraged.	1	3
Sedge Wren - Attempts for recovery should focus on grasslands at the upland edges of wetland areas, or grasslands with associated wet areas.	1, 2	3
Sedge Wren - The Connecticut River floodplain, the northwest corner of the state, and upland borders of salt marshes are areas where management efforts would have the highest probability of success, due to proximity to historic nesting areas and considering the habitats that are used by this species in other areas of the Northeast.	1	3
Sedge Wren - Efforts to survey sedge wren populations must extend through the summer months to cover the nesting season and provide reliable data to establish population trends.	7	26
Sedge Wren - Major stopover sites and overwintering areas also need to be determined.	7	26

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Sedge Wren - Annual standardized surveys should be coordinated regionally and conducted in the tidewater marshes.	7	26
Sedge Wren - Broadcasting recorded calls during surveys can elicit responses from inactive birds.	7	26
Sedge Wren - casual reports from birdwatchers and consulting biologists inventorying habitat may be the only feasible means of surveying populations.	7, 19	26
Sedge Wren - Conserving nesting habitat for sedge wrens and maintaining the integrity of wetland systems across wide geographic areas throughout the Northeast is perhaps the most pressing management need for the species. Such efforts should be coordinated regionally, and include the consideration of other Northeast faunal species of conservation concern with similar habitat requirements.	7, 21	26
Sedge Wren - Regional reductions of the water table due to extensive urbanization may prevent occurrence of water “ponding” in fields. “Ponding” creates the wet-meadow conditions preferred by sedge wrens. In addition, wetland loss often leads to drying processes on adjacent upland areas, and may ruin nesting habitat for sedge wrens and other Northeast species of conservation concern.	8	26
Sedge Wren - Efforts should be made to develop a statutory basis for withdrawing water, which would include a review of all urban development proposals in terms of the effects on wildlife of projected water withdrawal for urban, agricultural and industrial needs.	8	26
Sedge Wren - Research should be directed to determine safe water yield levels in aquatic systems that support Northeast species of conservation concern, and include water budgets, inputs, and outputs.	8	26
Sedge Wren - Efforts should be made to address impacts on the species’ habitat outside of its core range, and incorporate protection in wetlands legislation and land-use planning.	7, 21	26
Sedge Wren - The management of existing or potential nesting habitat should include protecting sufficient areas (greater than 5 ha) of wetlands and grassy margins of ponds, marshes, streams, rivers, hayfields and retired croplands, and brackish marshes.	1, 2	26
Sedge Wren - Managers should encourage dense, tall growths of sedges and grasses, and buffer those areas against pesticide runoff from adjacent agricultural areas.	2	26
Sedge Wren - Marsh fires during the breeding season should be controlled, as should livestock grazing and human disturbance that can threaten nesting success	2	26

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Sedge Wren - The opportunity to acquire and preserve grassland areas through the foreclosure of properties by the Farmers Home Administration (U.S. Department of Agriculture) should be investigated and those areas reviewed for habitat attributes by the USFWS.	1	26
Sedge Wren - Riparian zone management strategies at state and federal wildlife refuges can be altered to preserve or create grasslands and wet meadows adjacent to waterfowl impoundments and other wetlands in order to increase nesting habitat.	1	26
Sedge Wren - Detailed studies should be conducted to determine the habitat requirements of sedge wrens in the region, including preferred soil moisture regimes, vegetation height, density and composition, specific cover requirements for nesting, and minimum effective habitat area.	7	26
Sedge Wren - The relationships between habitat use, abundance of invertebrate prey, soil moisture, rainfall, wetland proximity, and grassland type also need to be defined.	7	26
Sedge Wren - Detailed studies also are needed on the nesting biology of sedge wrens in the Northeast, and should be initiated at sites with relatively long-established, reliable use by breeding individuals.	7	26
Sedge Wren - Provide areas of tall, dense planted cover, such as CRP or DNC	2	30
Sedge Wren - Minimize disturbance, such as mowing or herbicide spraying, during the breeding season Because Sedge Wrens have such a long nesting season, delay mowing even longer than the date generally recommended for other passerines of 15 July.	2, 9	30
Sedge Wren - Spray noxious weeds on a spot-by-spot basis, rather than on an entire-field basis	9	30
Sedge Wren - Create a mosaic of burned and unburned areas to provide for both nesting and foraging needs. Prevent encroachment by woody species in idle grassland by periodic disturbance; a rotational system of two or more grazing units may be most beneficial in providing distinct stands of grasses of various heights, but warm-season grasses should not be grazed <25 cm	2	30
Appalachian Bewick's wren -Immediate efforts should be taken to identify any localities where this species still occurs to determine if any remaining population strongholds exist and can be protected in the region. If populations are located, the precise characterization of the habitats near wren nests should be detailed, so that other potential breeding localities can be identified and protected. A public appeal requesting information may yield more information than conventional surveys of suitable habitat. Large-scale habitat restoration towards more open oak and native pine woodlands and savannas on western and southern facing aspects of the Appalachians is recommended. Active burning should also be considered in order to restore entire communities as well as those ecosystem processes that support the Bewick's wren.	1	8

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Marsh Wren - Maintain the current statewide population of 14,000 individuals.	7	32
Black-throated Blue Warbler – maintain current population estimates of 2,826 pairs and manage for optimal habitat objective of 9,410 hectares of suitable habitat necessary to support current populations at an average density of 3.33 hectares per pair.	7	1
Black-throated Blue Warbler - Maintain the current statewide population of 5,800 individuals.	7	32
Canada Warbler – increase current population estimates of 802 pairs to 880 pairs and manage for optimal habitat objective of 2,931 hectares of suitable habitat necessary to support 880 pairs at an average density of 3.33 hectares per pair.	7	1
Canada Warbler - Information on wintering grounds for this species is vital, since it is rapidly disappearing and remains poorly understood.	7	11
Canada Warbler - Studies are needed to establish population trends in the Northeast.	7	11
Canada Warbler - Exact habitat requirements and sensitivity to disturbances need to be determined.	7	11
Canada Warbler - All aspects of breeding biology need to be studied, as well as the factors influencing breeding success, including the impacts of forested wetland losses, the effects of management treatments, predation, and brood parasitism.	7	11
Canada Warbler - Management techniques that increase shrub density while limiting ground cover are preferred for this species. Clearcuts and shelterwood cuts have received more species' use than mature forests in northern New Hampshire.	2, 16	11
Canada Warbler - In general, populations decrease at the time of disturbance but expand as regeneration of the shrub layer occurs. In New York, population abundance peaked 5-15 years after heavy logging.	7	11
Canada Warbler - Because large numbers of deer are detrimental to the habitat quality of this species, deer population control should be considered.	1	11
Canada Warbler - Plans for road construction should consider the extreme sensitivity of this species to paved roads in nesting habitat, and construction should be avoided where possible in areas of species occurrence.	20	11
Canada Warbler - A regional effort should be encouraged to establish linked protected areas and buffer zones crossing state lines that are advantageous to Canada warblers and other species of conservation concern with similar habitat requirements.	21	11
Canada Warbler - Increase the statewide population from 1,500 to 2,300 individuals.	7	32

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Cerulean Warbler – increase current population estimates of 80 pairs to 88 pairs and manage for optimal habitat objective of 352 hectares of suitable habitat necessary to support 88 pairs at an average density of 4 hectares per pair.	7	1
Cerulean Warbler – Determine range of suitable habitats and identify present breeding sites for Cerulean Warbler in this region; develop better understanding of site conditions that attract these birds. (PIF)	7	1
Cerulean Warbler - Accurate, range-wide surveys of populations are needed using effective, species-specific censusing techniques and concentrating efforts on private land. State and regional surveys of the species should be conducted annually and coordinated regionally, and the methodology standardized.	7	12
Cerulean Warbler - An evaluation of the completed cerulean warbler atlas data by the Cornell Laboratory of Ornithology is needed.	7	12
Cerulean Warbler - survey techniques applicable in different physiographic situations should be developed.	7	12
Cerulean Warbler - More detailed information is needed to accurately determine population trends and distribution at the landscape scale.	7	12
Cerulean Warbler - Occupied forests should be surveyed specifically for this species and the preferred vegetation structure identified.	7	12
Cerulean Warbler - The location of breeding and wintering areas of individual populations should be identified and those sites protected to maintain forest cover useful to the species. Winter survivorship, habitat distribution, and relative abundance by habitat in South America are critical research needs.	7	12
Cerulean Warbler - The landscape characteristics of cerulean warbler occurrence, area-sensitivity, and distribution in relation to forest fragmentation need to be determined	7	12
Cerulean Warbler - Research is needed to identify at what point a landscape becomes too fragmented for these birds. Specific experimentation with silviculture methods of benefit to this species needs to be implemented.	7	12
Cerulean Warbler - Simple protection and manipulation of breeding habitats are the primary management tools.	1, 2	12
Cerulean Warbler - Large tracts of old forest in rich areas rather than in marginal soil types should be preserved at several locations throughout the range. Forest management that mimics the gap phase succession of eastern deciduous forests will more likely provide a continuous supply of potential habitat than will even-aged management in large blocks.	1, 16	12

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Cerulean Warbler - More research is needed to determine the specific age of trees at rotations that are most beneficial to the species in the Northeast. Research also is needed on the effectiveness of uneven-aged management systems (i.e., single tree and group selection) to maintain acceptable habitat conditions.	1, 16	12
Cerulean Warbler - The minimum size of forest tracts required to support stable breeding populations needs to be assessed.	1, 16	12
Cerulean Warbler - Since this species requires relatively large upland (especially mesic) or floodplain forested tracts for breeding, a regional effort should be encouraged to establish linked protected areas and buffer zones crossing state lines. This would be advantageous to cerulean warblers and other species of conservation concern with similar habitat requirements		12
Cerulean Warbler - Coordinated watershed protection, regulation, and enforcement should become a regional priority to maintain habitat quality.	21	12
Cerulean Warbler - Double the statewide population from 680 to 1,400 individuals.	7	32
Worm-eating Warbler – increase current population estimates of 3,404 pairs to 3,733 pairs and manage for optimal habitat objective 12,431 hectares of suitable habitat necessary to support 3,733 pairs at an average density of 3.33 hectares per pair.	7	1
Worm-eating Warbler - Selective logging and thinning of “overmature” trees may create favorable vegetation conditions. (PIF)	16	1
Worm-eating Warbler - Maintain the current statewide population of 7,300 individuals.	7	32
Blue-winged Warbler – increase current population estimates of 9,039 pairs to 12,656 pairs and manage for optimal habitat objective 20,249 hectares of suitable habitat necessary to support 12,656 pairs at an average density of 1.6 hectares per pair.	7	1
Blue- Winged Warbler - Significant nesting areas in need of identification through GIS and/or ground based surveys for potential nomination as IBAs	7	31
Blue-winged and Golden-winged Warblers - Determine range of suitable habitats and identify present breeding sites (PIF)	7	1
Blue-winged Warbler - Increase the statewide population from 18,000 to 27,000 individuals.	7	32
Golden-winged Warbler - Double the statewide population.	7	32

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Golden-winged Warbler - increase current population estimates of 18 pairs to 36 pairs and manage for optimal habitat objective 144 hectares of suitable habitat necessary to support 36 pairs at an average density of 4 hectares per pair.	7	1
Golden-winged Warbler - Analyze the effects of Blue-winged Warblers on recruitment, habitat selection, and nesting success of Golden-winged Warblers. (PIF)	7	1
Golden-winged Warbler - Further monitoring of cowbird parasitism rates and effects on reproductive success of Golden-winged Warblers is also needed. (PIF)	4	1
Golden-winged Warbler - Optimal management for this species would include rotational burning or intermittent farming. (PIF)	2	1
Golden-winged Warbler - There is an immediate need to document whether extra-pair copulation occurs frequently in upland habitat found to be occupied by both golden-winged and blue-winged warblers. If so, this may be an indication of poor quality habitat for sustaining the viability of golden-winged populations at that site.	7	15
Golden-winged Warbler - It is important to try to locate habitat segregation factors, since the loss of habitat has not been found a factor in the ongoing decline of the species.	1	15
Golden-winged Warbler - A coordinated census should be launched to locate viable nesting populations, and such investigations should be coordinated with the Laboratory of Ornithology at Cornell University.	7, 21	15
Golden-winged Warbler - nesting areas in need of identification for potential nomination as IBAs	7	31
Black-billed Cuckoo - Increase the statewide population from 1,200 to 1,800 individuals.	7	32
Yellow-bellied Sapsucker - Maintain the current statewide population of 16,000 individuals.	7	32
Northern Flicker - Increase the statewide population from 17,000 to 26,000 individuals.	7	32
Red-headed Woodpecker - Double the statewide population.	7	32
Eastern Wood-Pewee - Increase the statewide population from 14,000 to 21,000 individuals.	7	32
Acadian Flycatcher - Maintain the current statewide population of 740 individuals.	7	32
Great Crested Flycatcher - Maintain the current statewide population of 16,000 individuals.	7	32
Olive-sided Flycatcher - Double the statewide population.	7	32
Willow Flycatcher - Increase the statewide population from 3,100 to 4,700 individuals.	7	32
Eastern Kingbird - Increase the statewide population from 13,000 to 20,000 individuals.	7	32
Yellow-throated Vireo - Maintain the current statewide population of 7,200 individuals.	7	32
Veery - Increase the statewide population from 64,000 to 96,000 individuals.	7	32

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northern Parula - Maintain the current statewide population.	7	32
Black-throated Green Warbler - Maintain the current statewide population of 6,400 individuals	7	32
Blackburnian Warbler - Maintain the current statewide population of 2,400 individuals.	7	32
Black-and-white Warbler - Maintain the current statewide population of 44,000 individuals.	7	32
Prothonotary Warbler - Increase the statewide population.	7	32
Kentucky Warbler - Increase the statewide population.	7	32
Hooded Warbler - Maintain the current statewide population.	7	32
Chestnut-sided Warbler - Increase the statewide population from 27,000 to 41,000 individuals.	7	32
Prairie Warbler - Increase the statewide population from 4,000 individuals to 6,000 individuals.	7	32
Yellow-breasted Chat - Maintain the current statewide population.	7	32
Indigo Bunting - Increase the statewide population from 7,400 to 11,000 individuals.	7	32
Scarlet Tanager - Maintain the current statewide population of 20,000 individuals.	7	32
Rose-breasted Grosbeak - Increase the statewide population from 9,900 to 15,000 individuals.	7	32
Rusty Blackbird- Double the statewide population.	7	32
Baltimore Oriole- Increase the statewide population from 32,000 to 48,000 individuals.	7	32
Purple Finch - Increase the statewide population.	7	32
Northern Bobwhite - Double the statewide population from 480 to 960 individuals.	7	32
Brown Thrasher - Increase the statewide population from 1,800 to 2,700 individuals.	7	32
Louisiana Waterthrush – increase current population estimates of 1,447 pairs to 1,592 pairs and manage for optimal habitat objective of 11,145 hectares of suitable habitat necessary to support 1,592 pairs at an average density of 7 hectares per pair.	7	1
Louisiana Waterthrush - Headwater streams and wetlands of high water quality within large forest patches should be the targeted habitat. (PIF)	1	1
Louisiana Waterthrush - In smaller forest tracts, maintain at least a 100-meter buffer of mature forest cover along streamside and ravine habitat. (PIF)	2	1
Louisiana Waterthrush – Conduct population ecology studies of species. (PIF)	7	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Louisiana Waterthrush - Regionally, efforts should be made to document the differences in breeding densities in undisturbed, optimal habitat throughout their range. To do this, the identification of strategic physiographic regions within the Northeast is necessary, with a follow-up of subsampling in areas with high suitability index scores. (R. Mulvihill in Pennsylvania has developed a reliable protocol based on display surveys to assess species occurrence.)	21	21
Louisiana Waterthrush - Management for this species should focus on protecting core wooded riparian habitat, including the establishment and maintenance of a buffer strip of undisturbed riparian forest cover at least 100 meters wide (50 meters on each side), and protection and improvement of water quality.	1	21
Louisiana Waterthrush - More research is needed on the type of buffer strips necessary in areas where timbering and recreational trails occur.	16, 17	21
Louisiana Waterthrush - A coordinated, regional effort should be made to amend state and local wetland laws that do not protect the habitats of these birds. Coordinating such protection on local, state, regional, and federal levels is essential.	21	21
Louisiana Waterthrush - More information is needed on habitat use, behavior, migration ecology, and population ecology in the wintering range.	7	21
Louisiana Waterthrush - The effect of parasitism by the brown-headed cowbird also needs further study.	4	21
Louisiana Waterthrush - Maintain the current statewide population of 3,400 individuals.	7	32
Wood Thrush – increase current population estimates of 63,284 pairs to 88,590 pairs and manage for optimal habitat objective 295,006 hectares of suitable habitat necessary to support 88,590 pairs at an average density of 3.33 hectares per pair.	7	1
Wood Thrush - Selective logging and thinning of “overmature” trees may create favorable vegetation conditions. (PIF)	16	1
Wood Thrush – Determine factors limiting Wood Thrush populations in this region and causes of population declines. (PIF)	7	1
Wood Thrush - Increase the statewide population from 140,000 to 210,000 individuals.	7	32
Bicknell’s thrush - Demographic and population trend information is needed on this species, along with a determination of migration routes and winter ecology, and the effects of habitat degradation.	7	9

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bicknell's thrush - Few comprehensive breeding surveys have been established due to the challenging breeding habitat of this species, yet the expansion of such surveys is a critical need. A standardized, region-wide coordinated monitoring program should be implemented to assess and track populations of this species.	7	9
Bicknell's thrush - Habitat requirements, especially the amount of area needed to sustain secure populations, need to be determined.	7	9
Bicknell's thrush - Good GIS-level studies should be implemented to establish the extent of occupied habitat region-wide.	7	9
Bicknell's thrush - Efforts should be made to determine the factors limiting breeding and population success.	7	9
Bicknell's thrush - Because skewed sex ratios favoring males have been identified in Northeast breeding populations, studies should be directed to determine whether this is a "normal" situation in local populations or a situation resulting from other factors, and determine its effects on the long-term viability of the species.	7	9
Bicknell's thrush - Coordinated protection of high-elevation boreal habitat throughout the bird's breeding range in the Northeast is needed, along with the determination and understanding of the habitat blocks critical to maintaining sustainable populations.	1, 21	9
Bicknell's thrush - Areas or blocks of habitat supporting the most significant populations should be identified and protected.	1	9
Bicknell's thrush - Region-wide steps should be taken to reduce human impacts on the species	21	9
Bicknell's thrush - Resources should be directed to studies assessing the habitat characteristics and status of wintering grounds, and monitoring any changes that occur.	7	9
Eastern Towhee - increase current population estimates of 12,384 pairs to 24,767 pairs and manage for optimal habitat objective 24,767 hectares of suitable habitat necessary to support 24,767 pairs at an average density of 1 hectare per pair.	7	1
Eastern Towhee - Increase the statewide population from 26,000 to 39,000 individuals.	7	32
Cowbird - Research/monitoring is needed on effects of parasitism on shrubland birds. (PIF)	4	1
Chimney Swift - increase current population estimates of 22,710 pairs to 31,795 pairs and manage for optimal habitat objective 59,774 hectares of suitable habitat necessary to support 31,795 pairs at an average density of 1.88 hectares per pair.	7	1
Chimney Swift - Identify key breeding locations area	7	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Chimney Swift - Landowner contacts should be made at each site to encourage proper management for these species. (PIF)	19	1
Chimney Swift - distribute information materials on the use of rooftops and chimneys as nesting sites. (PIF)	19	1
Chimney Swift - Develop and implement public education programs to encourage reports Chimney Swifts; develop urban public education in schools to aid in the monitoring and assessment of populations of these species. (PIF)	19	1
Chimney Swifts - Develop an appropriate survey method for tracking populations and conduct a thorough status assessment of these species. (PIF)	7	1
Chimney Swift - Increase the statewide population from 46,000 to 69,000 individuals.	7	32
Common Nighthawks - Develop an appropriate survey method for tracking populations and conduct a thorough status assessment of these species. (PIF)	7	1
Common Nighthawks should be identified for immediate conservation efforts. (PIF)	7	1
Common Nighthawk - Some building nesting areas in need of identification for potential nomination as IBAs	7	31
Whip-poor-will - These birds are not well censused by standard population monitoring programs. There is a need to develop new region-wide standardized techniques and to devote additional effort to inventorying and monitoring this species. More effort should be made to locate and report occurrence in August and September.	7	29
Whip-poor-will - More research should be directed toward habitat use and requirements, since it appears that local populations utilize a diversity of forest types throughout the Northeast, which is a hopeful sign for its recovery and survival.	7	29
Whip-poor-will - Drastic population declines in certain areas have been followed by increases near edges of power lines and at reclaimed strip-mine areas reforested with birches, oaks, or maples.	7	29
Whip-poor-will - Reasons for population declines should be studied, including the effects of pesticide use for gypsy moth eradication.	7	29
Whip-poor-will - BT has been reported to be toxic to more than 40 species of lepidopterans, resulting in possible insect prey declines for this and other species of nightjars. Because this species flies low to the ground while foraging along roads, its vulnerability to road mortality should be considered in plans to pave rural roads in areas where it occurs. Roadside mortality studies should be encouraged.	9	29

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Whip-poor-will - the effects of grazing on this and other ground-nesting species of conservation concern need further study.	2, 15	29
Whip-poor-will - Increase the statewide population from 1,300 to 2,000 individuals.	7	32
Ruffed Grouse -Support management (through burning, clearcutting, plantings, etc.) of early succession forest habitat, maintenance of old fields, shrubs, soft mast; particularly aspen, conifers, and soft mast; some orchards, juniper, oak, etc.; have funded 2 projects in Connecticut on Connecticut DEP lands in 1992 and 1994 for \$13,900.00 total, on 3086 acres total in the Connecticut River valley	2	4
Ruffed Grouse - Increase the statewide population from 1,600 to 2,400 individuals	7	32
Woodcock - increase populations of woodcock to levels consistent with the demands of consumptive and non-consumptive users	7	5
Woodcock - reliable annual population estimates, harvest estimates and information on recruitment and distribution are essential for comprehensive management.	7	5
Woodcock – participate in Woodcock Task Force to halt breeding population declines	21	5
American Woodcock - Determine effects of woodcock habitat management techniques on other priority, early-successional bird species. (PIF)	7	1
American Woodcock - Maintain stable breeding population; reverse recent population declines.	7	1
Northern Harrier - If large grassland habitats are restored and upland edges of wetlands protected, Connecticut could provide additional habitat for birds from populations in eastern Massachusetts as the habitat occupied by those populations becomes saturated.	1, 2	3
Northern Harrier - Known existing breeding locations in Connecticut should be protected and managed for this species.	1, 7	3
Northern Harrier - Potential nesting habitats such as large grasslands and upland edges of salt marshes or other large wetlands should be a high priority for acquisition and restoration.	1, 19	3
Northern Harrier - A goal of six nesting pairs of Northern Harriers may give this species a cushion from the risk of again becoming extirpated from Connecticut.	7	3
Northern Harrier - Standardized, regional monitoring protocols need to be developed, perhaps coordinated with grassland bird surveys. Breeding sites, wintering areas, and habitat requirements also need to be identified.	7	22
Northern Harrier - Monitoring of reproductive success is desirable, especially where issues of disturbance exist.	7	22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northern Harrier - Both breeding and wintering habitats should be protected and managed to provide a complex of several different undisturbed habitat types, especially early successional habitats for nesting and hunting.	1	22
Northern Harrier - The enforcement of existing federal and state wetland protection laws will help prevent further fragmentation and destruction of breeding and wintering habitat. Regulatory measures and direct acquisition should be encouraged to protect large complexes of grasslands, shrublands, and wetlands from development.	18	22
Northern Harrier - Regional efforts should focus on determining how key habitats in the region can be preserved where the cost of land acquisition is prohibitive, and to improve cooperation among biologists to avoid duplication of research efforts.	21	22
Northern Harrier - Actions to minimize human-caused disturbance and direct mortality from off-road vehicles, pets, and recreational activities should be taken.	17	22
Northern Harrier - Beneficial agricultural practices should be encouraged, including late mowing, involvement in the Conservation Reserve Program, and the development of incentives for the maintenance of grassland habitat.	15	22
Northern Harrier - The ditching of saltmarshes for mosquito control should be discouraged.	2	22
Northern Harrier - Research needs include: 1) determining the relative quality of shrublands as breeding and foraging habitats; 2) the identification of important breeding and wintering sites; 3) an understanding of the minimum area requirements and the habitat characteristics necessary to support breeding populations; 4) the identification of agricultural practices beneficial to breeding and wintering success, and the amount and type of disturbances breeding harriers will tolerate; 5) investigating the relationship between harrier wintering distribution and abundance in coastal Massachusetts, Rhode Island, and Connecticut, and breeding birds in those same areas; 6) coordinating with the southeastern U.S. to determine population trends of wintering birds; 7) determining the effects of saltmarsh ditching on harrier populations and their major prey species; 8) collecting data on hunting habitat and roost site selection in various habitats; 9) conducting analyses of pellets and prey remains found at roost sites to identify prey selection of nonbreeding birds; 10) determining the causes of breeding failure and mortality; 11) monitoring the current levels of biocides and comparing with results of previous studies; 12) determining the sizes of hunting ranges during breeding and nonbreeding seasons with varying densities of harriers and habitat types; 13) implementing accurate and standardized survey methods to determine regional population trends; 14) conducting studies on techniques used to maintain early successional habitats and making comparisons between them.	7	22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northern Harrier - Collaborate with ranching and farming interests to preserve and maintain native grassland (rangeland and pasture land) through conservation easements, land purchases, and development of farm programs that hold conservation of wildlife habitat in high priority.	15, 19	30
Northern Harrier - Continue the Conservation Reserve Program to provide nesting and foraging habitat.	19	30
Northern Harrier - Discourage farmers from tilling wetlands. Protect wetlands from drainage through conservation easements, land purchases, tax incentives, management agreements, restoration, continuation of Wetland Reserve Program, and enforcement of wetland-protection regulations.	15	30
Northern Harrier - Maintain a mosaic of grasslands and wetlands so that while some units are being treated to halt succession, other units are available. Treated units should be small (100-200 ha) to minimize the number of displaced nesting harriers. Untreated units should be large enough to meet the requirements of multiple female harriers during the nesting season.	2	30
Northern Harrier - In tallgrass areas, provide native and/or tame grasslands that have been recently (≤ 3 yr) idled. (Harriers prefer nesting in idle areas over mowed areas, grazed areas and annually burned areas)	2	30
Northern Harrier - Plant warm-season grasses and legumes where natural vegetation has been destroyed by drainage, burning, tillage, overgrazing, or conversion to cropland.	2	30
Northern Harrier - Mowing, burning, or grazing is recommended every 3-5 yr to maintain habitat for small mammal prey and every 2-5 yr to maintain the old accumulations of residual vegetation preferred by Northern Harriers	2	30
Northern Harrier - Avoid disturbing nesting areas during the breeding season, about April through July	2	30
Northern Harrier - Where water levels are artificially maintained, do not allow water levels to rise ≥ 15 cm from April to August. Otherwise, nests in wetland habitat may become submerged	8	30
Northern Harrier - On large islands, maintain tame grass/legume and brush cover and reduce mammalian predators	2	30
Northern Harrier - Minimize human disturbance near nests	6, 17	30
Northern Harrier - Do not use chemical pesticides in habitats used by harriers	9	30

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Long-eared Owl - These secretive nocturnal birds are not adequately covered by standard population monitoring programs. There is a need to develop new techniques and devote extra effort to inventorying and monitoring these birds to determine breeding and wintering population abundance, distribution, and trends throughout the Northeast. A standardized survey protocol should be used (see new Canadian protocol [Takats et al.] ...). There is a lack of demographic and nest productivity data for this species. Regional effort should be made to encourage participation in national programs to fill these data gaps, such as MAPS, BBIRD, and Cornell Lab of Ornithology "Citizen Science" programs	7	20
Short-eared Owl -It is unlikely that this former breeder will return to Connecticut as a nesting species. Additional grassland habitat would benefit wintering or migrating birds. Efforts should concentrate on protecting wintering populations and reducing disturbance at key winter roosting areas. Management methods that leave standing vegetation over the winter should be encouraged for large grasslands or areas with a mosaic of agriculture and hayfields.	7	3
Short-eared owl - There is evidence that short-eared owls have been breeding somewhat intermittently for the past 15 years in recovered strip-mine areas of Pennsylvania. This may be an indicator that the recovery of the Northeast population is possible with the restoration of suitable nesting habitat.	7	27
Short-eared Owl - Land preservation efforts should be aimed at protecting large tracts of open grassland, salt and freshwater marshes, and areas with low vegetation. Areas of 50 ha or more, within the breeding or wintering range, composed of low, open grasslands or similar habitat (particularly coastal grasslands, heaths, and saltmarshes) with abundant small mammal populations, should be considered as potential habitat.	1	27
Short-eared Owl - Suitable habitat areas must be actively managed and maintained for the species through the use of mowing and burning outside of the nesting season. Care should be taken to allow for adequate build-up of litter layer as habitat for prey population.	2	27
Short-eared Owl - Control of predators in nesting areas is a controversial management tool where predator populations are high and known to be affecting nesting success.	4	27
Short-eared Owl - Education programs to help alleviate human-related disturbances should be developed.	19	27
Short-eared Owl - Effective standardized monitoring procedures and techniques need to be developed and coordinated regionally. Local breeding and wintering populations need to be surveyed to determine abundance and distribution, and to direct land preservation efforts.	7	27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Short-eared Owl - The limiting factors and management needs of populations need further study. More information is needed on the relationships between territory size and small mammal abundance in order to determine the amount of open habitat and prey base required to support a breeding pair. Research on the management of open habitat and its effect on prey population is needed, along with the effects of burning, mowing, or plowing on small mammal populations. The effects of habitat fragmentation should be determined, especially in terms of territorial integrity and breeding success. The investigation of nocturnal movements, the study of movement in and out of isolated populations, and estimates of adult and juvenile mortality also should be pursued.	7	27
Short-eared Owl - Create and protect large open areas for Short-eared Owls and their prey	1, 2	30
Short-eared Owl - Because they are nomadic, they may be present only sporadically, but suitable habitat should be maintained and native grassland preserved. Maintain a mosaic of grasslands and wetlands so that some units are available for nesting, while others are being treated to halt succession	2	30
Short-eared Owl - Collaborate with ranching and farming advocates to maintain native pasture and rangeland through conservation easements, land purchases, and development of farm programs with wildlife habitat conservation priorities. Continue the Conservation Reserve Program to preserve nesting habitat.	15, 19	30
Short-eared Owl - In tallgrass areas, burning, mowing, or grazing every 2-5 yr is recommended to maintain habitat for small mammal prey to reduce grass height and maintain vegetation 30-40 cm tall.	2	30
Short-eared Owl - To prevent mortality or injury from collisions with fences, remove unused fences and increase visibility of fences by hanging pieces of ribbon or foil.	2	30
Short-eared Owl - Double the statewide population.	7	32
Barn Owl - would benefit from the continuation and expansion of current nesting box programs, the creation of more grassland habitat, and farmland preservation.	2, 15, 19	3
Barred Owl – Need studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PIF)	7	1
Cooper’s Hawk – Need studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PIF)	7	1
Red-shouldered Hawk – Need studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors (PIF)	7	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
American Kestrel- Nest box programs should be instituted in suitable grassland habitat and agricultural areas, especially those where kestrels have been seen during the breeding season in recent years. A recovery goal of 128 nesting pairs of kestrels would restore the population [in Connecticut] to 1980s levels. This estimate assumes that ~50% of the probable nesting locations recorded during the Breeding Bird Atlas Project were actually occupied by nesting birds, and that there was only one pair at each site where breeding was confirmed.	1, 2	3
Golden Eagle – Determine status of suitable open migratory and wintering habitat in the Northeast. Past studies have shown declines due to reforestation in the Northeast. A better understanding of the distribution and abundance of the migrant population is needed, including their movement patterns and the identification of key wintering areas, if such sites exist. Tagging and radio-tracking birds to determine site fidelity, stopover points, and origination of birds, should be considered. More information is needed on the wintering habitat utilization.	7	14
Peregrine Falcon - Some building nesting areas in need of identification for potential nomination as IBAs	7	31
Peregrine Falcon - Some bridge nesting areas in need of identification for potential nomination as IBAs	7	31
Broad-winged Hawk - Maintain the current statewide population of 5,500 individuals	7	32

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Study the role of commercial fisheries in seabird mortality. (S. Atlantic Migratory Bird Initiative)	1,3,14	1
Develop partnerships with fishery industries and sport anglers. (S. Atlantic Migratory Bird Initiative)	14,17	1
Partner with fishery planners to include reduced seabird mortality strategies in all future plans. (S. Atlantic Migratory Bird Initiative)	14,17	1
Implement increased enforcement of shipping activities, safe operational procedures, spill clean-up, and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative)	9	1
Prohibit and enforce dumping of debris, lines, and nets. (S. Atlantic Migratory Bird Initiative)	9,14	1
Develop non-persistent lines, nets and traps. (S. Atlantic Migratory Bird Initiative)	9,14	1
Fund and appoint state colonial waterbird coordinator. (S. Atlantic Migratory Bird Initiative)	18	1
Research best method of priority habitat protection—acquisition, fee or easements from willing sellers	19	1
Implement Landowner information/incentive program (LW) (coordinate with PIF recommendations) for high priority species. (BCR 30 workshop)	19	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

"Other" Conservation Action (including policy and education)	Threat Addressed	Source
Train land managers to manage habitat for shorebirds by increasing the number of Manomet habitat management workshops. (MANEM working group)	18	1
Effects of oil spills on birds should be minimized by increased enforcement of shipping activities, safe operational procedures, spill clean up and rehabilitation of oiled birds. (S. Atlantic Migratory Bird Initiative)	9	1
Develop and implement outreach projects to reduce human disturbance (BCR 30 workshop)	19	1
Partner with existing organizations to enhance efforts to eliminate or reduce human disturbance	19	1
Increase law enforcement at protected sites and sites with human disturbance	6, 18	1
Increase agency capacity focused on permit and technical assistance for shorebird, landbird, and waterbird species.	18	1
State agencies should fund incentives or measures to eliminate waterbird bycatch; specific suggestion for mid-Atlantic is to buy out gill-net fisheries. (BCR 30 workshop)	13,18	1
Fund independent assessment for addressing effects of bird strikes at wind power facilities. (BCR 30 workshop)	9	1
Encourage local planning to ensure important breeding and non-breeding habitat is not affected by sea level rise due to climate change. (BCR 30 workshop)	8	1
Encourage state fishery programs to include impacts to birds in future fishery plans. (S. Atlantic Migratory Bird Initiative)	14,21	1
Ensure that an appropriate staff person from each state is involved with the aquaculture regulatory process. (BCR 30 workshop)	18	1
Develop Best Management Practices for aquaculture that minimizes impacts to shorebirds. (BCR 30 workshop)	14	1
Restrict access to nesting beaches during late May to late July.	6, 17	1
Prohibit free-running dogs.	6, 17	1
Post signs to alert and educate public to presence of nesting birds.	6, 17	1
Use fences and other barriers to reduce human impacts.	6, 17	1
Protect breeding sites from habitat alteration and overuse from recreational activities, including nighttime activities.	6, 17	1
Implement or utilize existing (partners) outreach opportunities to educate public about their impacts to wildlife (Ct. DEP program).	19	1
Increase outreach activities to gain support for protection of species.	19	1
Implement new and existing outreach efforts to the general public to gain support for wetland protection.	19	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Participate/establish a network of managers, biologists, and researchers are needed across Southern New England to more effectively address the needs and coordinate conservation efforts for the high priority urban birds. (PIF)	18, 21	1
Surveying efforts, identification of significant breeding locations, and public education/outreach for urban species should be coordinated on a regional basis. (PIF)	7, 19, 21	1
Monitor through loosely structured citizen science projects, centered on E-bird (Audubon and Cornell’s online, centralized citizen science database) that would encourage individual birders to record avian data collected in the course of their normal birding activities.	7, 19	
Monitor using pre-packaged citizen science projects with reasonably straightforward protocols selected to best determine relative abundance and trends for key species at each IBA site. The Conte Neotropical Migratory Bird Stopover Habitat Study would be a good example of such a program.	7, 19	
Support more structured research overseen at the university or professional level and conducted by interns or investigators aimed at answering specific questions about an IBA site, habitat or species.	7	
Serve as a catalyst between conservation, advocacy and education groups, including Chapters, and scientists with the wherewithal to support concrete research proposals.	19	
Foster partnerships with Audubon Chapters, non-profit conservation organizations, landowners, university researchers, state, federal and local agencies, corporations, stewardship adoption groups, and others in advancing the IBA program in Connecticut	19, 21	2
Publicly announce 75 IBA's within 3 years (15 sites announced; 13 scheduled for announcement by summer 2004; 11 additional sites are being prepped for announcement and are in need of review by the Connecticut DEP or have complex questions to be resolved; 9 additional nominated sites in need of review by the Technical Committee).	1, 21	2
Generate additional nominations to complete IBA site inventory within 5 years - Engage the IBA Technical Committee, chapters, bird clubs and other local and statewide birding and environmental organizations (Hartford Audubon Society, Connecticut Audubon Society, New Haven Bird Club, Connecticut Ornithological Association, land trusts etc), in the nomination process.	1, 21	2
Complete IBA site inventory within 5 years. Conduct a GIS analysis to ensure key IBA sites are covered for all habitat types and solicit nominations as necessary	1, 21	2
Develop a major IBA campaign on Long Island Sound.	1, 21	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

"Other" Conservation Action (including policy and education)	Threat Addressed	Source
Develop model conservation plans for IBA's within each of the representative habitat types, as soon as funding is available by the end of 2005.	1	2
Stewardship Adoption Program: Work with Centers, Chapters, bird clubs, and other partners to get involved with local IBA's as stewards and foster conservation action at identified IBA's (e.g. clean-ups, monitoring, restoration, education and other activities, inventory, conservation planning and implementation and "watchdog" role.)	19	2
Continue to advocate for state and federal open space funding (Recreation and Natural Heritage, Municipal Open Space and Watershed Protection Program, and other programs)	19	2
Take full advantage of federal and state land acquisition programs where land protection is necessary to ensure integrity of IBAs (most programs require matching funds)	18, 19	2
Provide information on land protection funding opportunities to conservation partners working on land protection projects at IBAs.	18, 19	2
Monitor land protection opportunities and development threats (ongoing)	19, 29	2
Develop an annual list of top priority IBA's for open space acquisition and habitat protection (goal: increase acreage of IBA's protected through acquisition and easement)	19	2
Hold meetings with land trusts focusing on land protection needs at IBAs.	19	2
Investigate programs that might provide private landowners incentives to undertake conservation actions on IBA's (e.g. WHIP Program, Private Stewardship Grants, etc...)	19	2
Empower groups to tap in to grants and partnerships to facilitate effective management and restoration (e.g. Joint Ventures, USFWS, DOA, EPA, SWG, DOT and USACOE programs.)	18, 19	2
Encourage the adoption of a statewide land use policy addressing sprawl and ensuring consistency between planning and zoning regulations and insuring that bird conservation issues are incorporated into statewide, regional and municipal plans of conservation and development.	20, 21	2
Continue to advocate for strengthening and protecting existing environmental laws	19	2
Investigate the feasibility of developing a NY-type state IBA law	19	2
Incorporate IBA conservation plans into USFWS Comprehensive Conservation Planning process	21	2
Ensure IBA goals are incorporated into statewide and regional plans, e.g. Comprehensive Wildlife Management Plan, Statewide forestry resources plan, Partners in Flight, NABCI, waterbird, shorebird plans, Early successional working groups).	21	2
Ensure that statewide and regional plan goals are addressed by IBA program	21	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Develop a list of citizen science opportunities at Audubon Centers and IBA’s, and publish widely	19	2
Develop an effective communications strategy for Audubon Connecticut’s Bird Conservation and IBA programs, including media, web site, Chapter- or Center-sponsored educational walks, Bird Checklists for IBA’s, Signage identifying sites as IBA’s, and Educational/interpretive signage, where appropriate	19	2
Enhanced wildlife viewing opportunities, where appropriate, and working in conjunction with Birding Trails where appropriate	17	2
Educate local officials about landscape scale issues that may not be readily apparent by looking only within town boundaries (e.g. Metacomet Ridge and Prospect Ridge Models)	19, 21	2
Collaborate with conservation organizations in advancing the concept of Long Island Sound Stewardship system	12	2
Advocate for continued state and federal funding for Long Island Sound clean-up activities	12	2
Collaborate with Audubon Connecticut and Audubon New York to assess how to apply the IBA program to Long Island Sound.	12	2
Assess whether Long Island Sound should be elevated to a major NAS Regional Campaign (like the Everglades, San Francisco Bay and the Upper Mississippi River)	12	2
Advise and assist in the coordination of state and federal agencies, municipalities, non-profit land conservation organizations and private landowners in meeting goals for grassland protection;	21	2
Investigate and solicit federal, state and private funding for the management and restoration of grassland habitats	18	2
Investigate the feasibility of a financial incentives program to assist landowners in management efforts to improve grassland habitats	18	2
Foster education and public awareness programs to foster support for grassland birds and other grassland wildlife conservation efforts, including development of a network of grassland habitat management demonstration sites on public and private lands.	19	2
Advocate for a ban on the sale of non-native invasive plants in the state	3, 19	2
Provide data to bird conservation group members and others concerned about the impacts of migration hazards on birds, other wildlife and their habitats	19	2
Ensure that bird conservation education and advocacy efforts are based on strong science.	19	2
Call on experts to assist in addressing key issues affecting birds, wildlife and habitat	21	2
Train participants in Audubon Citizen Science projects, provide technical support; and encourage Chapters and Centers to participate in citizen science projects.	19	2

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Encourage regular joint sessions of the Policy, Education and Centers and Science and Bird Conservation Committees of the Audubon Connecticut Board to ensure a cohesive program to advance Audubon's visions and goals	21	2
Continuing state bond funding for the state’s three land acquisition programs to provide the financial resources necessary to advance the protection of key grassland areas and other critical habitats across the state.	18	3
Coordinate and establish programs to work with farmers and other private landowners to ensure a network of 3,500 acres of managed late-harvested hayfields in blocks of at least 25 acres, allowing successful nesting of species that will use hayfield habitat.	15, 19	3
Take full advantage of existing programs that can subsidize the late mowing of hayfields on private property and investigate the feasibility of new subsidy programs that can compensate farmers for the economic impact of late mowing.	15, 18	3
Support the DEP Wildlife Divisions efforts to investigate and solicit additional funding sources for the management and restoration of grassland habitats, including from the USDA and the USFWS, through partnership with an advisory committee.	18	3
Establish a Grasslands Advisory Committee, which will serve as a vehicle for cooperation between federal, state, municipal, non-profit and private entities for grassland conservation projects. The committee should be made up of representatives of the CT DEP, USFWS, and the USDA, universities and non-governmental organizations.	21	3
Establish a financial incentives program (similar to NRCS WHIP or others) through the Connecticut DEP Wildlife Division to assist landowners in management efforts to improve grassland and other early successional habitats.	18	3
Provide additional staff at the DEP to coordinate grassland habitat management efforts and fund and staff a new full-time Grassland Bird Specialist at the DEP Wildlife Division, or a full-time statewide ornithologist who could devote a significant amount of time to grassland birds to develop specific programs, resources and timetables to achieve the acreage objectives. The monies required for this position could be used as state-required matching funds for federal grand programs such as Federal State Wildlife Grants money, the Conservation and Restoration Act (CARA) and Wildlife Conservation and Restoration Program (WCRP).	18	3
Provide funding to the DEP to support surveys (including aerial mapping) and the like, and to supplement the position with specialized expertise as needed.	18	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Acquire necessary equipment for grassland restoration and creation, including a seeder capable of planting warm-season grasses.	18	3
Encourage support and funding for a potential new graduate level Wildlife Intern Science and Extension (WISE) training program in Natural Resources and Cooperative Extension at the Land Grant University (University of Connecticut), to prepare pre-professionals for assisting land managers (private individuals, organizations, sportsmen’s groups, agencies, municipalities, others) in creating and managing grassland habitats and species.	18	3
Establish a network of grassland habitat management demonstration sites on public and private lands, with funding to help develop and maintain the sites, and evaluate results.	19	3
Establish grants in support of grassland wildlife research, education and service projects	18	3
Encourage U.S. FWS Refuges, CTDEP Wildlife and Forestry Divisions, municipalities, land trusts and other land managers to feature and publicize conservation of grassland species on their lands.	19	3
Develop grassland conservation education packets for use in primary and secondary school programs including 4-H, Vocational Agriculture and Natural Resources, Envirothon, Project WILD and others; consider adopting a grassland bird logo as representative of grassland conservation efforts.	19	3
Contribute informational items about grassland habitats to periodic electronic and/or paper copy newsletters.	19	3
Foster public awareness and support for grassland birds and other grassland wildlife conservation efforts through distributing promotional materials to the media, existing education programs (e.g., Coverts Project, Master Wildlife Conservationist, Land Trust Service Bureau, Farm Bureau, others), agencies, non-government organizations, sportsmen’s groups, land trusts, vocational high schools, community colleges and others.	19	3
Develop mechanisms to provide long-term protection of plovers and their habitat by seeking long-term agreements with landowners. Acquire important habitat if and when it becomes available. Ensure that any Section 10 permits issued contribute to Atlantic Coast piping plover conservation.	18, 19, 20	6
Develop and implement public information and education programs, including new and updated piping plover information and education materials. Establish a network for distribution of information and education materials.	19	6
Review progress towards recovery annually and revise recovery efforts as appropriate.		6

**HERPETOFAUNA: Compilation of Conservation Actions for Connecticut
from Existing Management Plans and Literature**

Source Codes:

- 1 = Calhoun and Klemens (2002): Best Development Practices: Conserving pool-breeding amphibians...
- 2 = Gibbons et al. 2000. Reptiles in Decline: The Global Decline of Reptiles, Déjà Vu Amphibians. *Bioscience* 50:653-666.
- 3 = PARC: Habitat Management Guidelines for Amphibians and Reptiles of the Midwest
- 4 = PARC: Amphibian and Reptile Conservation Program Brochure
- 5 = USFWS Recovery Plan (2001) for the Bog Turtle (*Clemmys muhlenbergii*)
- 6 = Bailey, M.A., J.N. Holmes, and K.A. Buhlmann. 2004. Habitat management guidelines for amphibians and reptiles of the southeastern United States. PARC Technical Publication HMG-2
- 7 = NRCS: Using Micro and Macrotopography in Wetland Restoration. Indiana Biology Technical Note No. 1
- 8 = Pew Oceans Commission (2003): America's Living Oceans: Charting a Course for Sea Change. A Report to the Nation, Recommendations for a New Ocean Policy
- 9 = Biebighauser: A Guide to Creating Vernal Ponds
- 10 = Proceedings of the Partners in Amphibian and Reptile Conservation (PARC) Conference Atlanta, Georgia June, 1999: conserving amphibians and reptiles in the new millennium
- 11 = NMFS and USFWS Recovery Plan (1991) for the Atlantic Green Turtle (*Chelonia mydas*)
- 12 = NMFS and USFWS Recovery Plan (1993) for the Hawksbill Turtle (*Eretmochelys imbricata*)
- 13 = NMFS and USFWS Recovery Plan (1992) for the Kemp's Ridley Turtle (*Lepidochelys kempii*)
- 14 = NMFS and USFWS Recovery Plan (1991) for the Loggerhead Turtle (*Caretta caretta*)
- 15 = NMFS and USFWS Recovery Plan (1992) for the Leatherback Turtle (*Dermochelys coriacea*)
- 16 = NEES&WDTC (draft)
- 17 = The Nature Conservancy (comment letter of October 27, 2003)
- 18 = TNC (1999): North Atlantic Coast Ecoregional Conservation Plan
- 19 = TNC (2003): Lower New England – Northern Piedmont Ecoregional Conservation Plan
- 20 = CT OPM (1998): Conservation and Development Policies Plan for Connecticut, 1998-2003

Threat Addressed by Conservation Action Codes:

- 1 = Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction projects, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)
- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in long island sound and estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)
- 20 = Unplanned urban development and growth (lack of landowner incentives, inability to control or influence private land development under local jurisdiction, lack of information to municipalities, population growth, changing economy, etc.)
- 21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Maintain an undeveloped forested habitat around vernal pool habitat, including both canopy and understory (e.g., shrubs and herbaceous vegetation)	1	1, 6
Avoid barriers to amphibian dispersal (emigration, immigration). Maintain or restore corridors connecting wetlands or vernal pools.	1	1, 3, 6
Encourage the preservation, maintenance, and creation of corridors connecting natural areas within agricultural environments; develop corridors between habitat fragments to provide habitat complexes rather than habitat islands	1, 2	3
Where existing habitat must be removed, avoid dividing an existing fragment; clusters of suitable fragments should be maintained as a whole whenever possible.	1	3
Protect and maintain vernal pool hydrology and water quality. Maintain a pesticide-free environment.	1, 9	1
Maintain or restore a minimum of 75% of the contiguous (i.e., unfragmented) forest with undisturbed ground cover within 750 feet of vernal pools.	1	1
Avoid release of invasive non-native species that could be harmful to reptile populations	3	2, 6
Research to understand/quantify direct and indirect effects of environmental pollution, disease and parasitism, and global climate change on herpetofauna	8, 9, 10	2
Develop a habitat management plan based on an evaluation of the existing conditions on and adjacent to the habitat(s) being considered, with input of both a local herpetologist and a local habitat management specialist.	1, 2, 3, 6, 8, 11, 15, 16, 17, 20	1, 3, 21
Mow and plow during winter months in areas with dense vegetation; areas mowed as lawn during the active season should be mowed during cold, overcast weather or at the hottest time of the day to minimize mortality; avoid early spring mowing during amphibian migration events	2, 6, 11	3, 6
When mowing during the active season, other than to maintain lawns or trails, mower deck heights should be set at a minimum of 8 and perhaps even 12 inches to minimize mortality; mow in rows (e.g., back and forth across a field) as opposed to circular mowing (where you finish in the middle of a mowed field). In areas where shorter grass must be maintained (e.g., lawns or trails), keep the grass continuously short (under five inches) to render it less attractive for amphibians and reptiles; areas newly selected to be lawn should be brought to low height during the inactive season, then maintained as described above for lawn thereafter	2, 6, 11	3, 6

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Minimize mortality and loss of cover by using patch mowing when addressing brush, small tree, or exotic species invasions. No more than one third of a patch should be mowed at a time.	2, 6, 11	3
Avoid mowing shorelines and drainage ditches in agricultural areas mid-spring through mid-fall	1, 2, 6, 15	3
Disking (to restore native vegetation) should only be done during the dormant period for amphibians and reptiles.	2, 3, 6	3
Avoid disking within 100 feet of known hibernacula; disking in uplands within wetland areas should only be conducted outside of the buffer area and during the inactive season.	2, 3, 6	3
Avoid disking turtle nesting areas	6	3
Restrict prescribed burns to times when herpetofauna are least likely to be active (ambient temperatures below 50°F (10°C); before spring rains following frost-out often trigger emergence of early breeding amphibians and cool-tolerant reptiles). Winter burns will minimize impacts.	1, 2, 3	1, 2, 3
Spot-burning, or precision burning, is sometimes preferable to large area burns, especially where the goal is to only burn individual woody stems.	1,2, 3	1, 2, 3
Habitats suitable for the application of prescribed fire for herpetofauna include pinelands, savannas, prairies and grasslands, fens, ephemeral wetlands, some forested habitats and peatlands.	1,2, 3	1, 2, 3, 6
To minimize mortality and maintain adequate cover, burn habitats in patches, leaving a mosaic of burned and unburned habitat; burn no more than one-third of a patch in any one year.	1, 2, 3	3
Incorporate multiple-use purposes for the placement of roads, trails, and firebreaks into fire management protocols (e.g., place roads and trails in strategic locations and maintain them as firebreaks between burn units)	1, 2, 3, 6, 11, 17, 21	3, 6
Keep livestock out of natural wetlands, watercourses and breeding ponds; restrict water crossings and site watering stations at artificial sites, or at selected, closely controlled locations	6, 9	3, 6, 9
Light to moderate grazing (less than one animal per acre) is best used as a management technique in grasslands, savannas, barrens, and open woodlands; use grazing in rotations (spatial and temporal) among habitat patches, with no more that one third of the available habitat grazed in one year. Grazing should be discontinued in a patch as soon as 50 percent of the grasses and forbs in that patch are cropped to eight inches in height.	2, 3, 6, 15	3, 6

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Introduce grazing animals when they will be most likely to damage undesirable vegetation without significantly impacting native species.	2, 3	3, 6
Avoid winter drawdowns when restoring hydrology	8	3
Avoid hydrologic alterations (e.g., conversion of ephemeral wetlands to permanent wetlands); restore historical water levels and patterns of fluctuation in an area	1, 2, 8	3, 6
Vernal pool depressions should never be used, either temporarily or permanently, for stormwater detention or biofiltration; locate detention ponds at least 750 feet from a vernal pool; do not site detention ponds between vernal pools or in areas that are primary amphibian overland migration routes	1, 8, 9	1, 6
Treat stormwater runoff using grassy swales with less than 1:4 sloping edges. If curbing is required, use Cape Cod curbing. Maximize open drainage treatment of stormwater. Use hydrodynamic separators only in conjunction with Cape Cod curbing or swales to avoid funneling amphibians into treatment chambers, where they are killed	6, 8, 9	1
Maintain inputs to the vernal pool watershed at pre-construction levels. Avoid causing increases or decreases in water levels	8, 9, 20	1
Exterior and road lighting within 750 feet of a vernal pool should use low spillage lights. Avoid using fluorescent and mercury vapor lighting	6, 9	1
Minimize disturbance by marking the edge of a protected area with permanent markers; granite monuments or stone cairns could be placed every 10 feet. Where intrusion is a concern, small sections of stone wall could be erected; these walls should be discontinuous to avoid impeding amphibian dispersal.	6, 17	1
Avoid use of herbicides within 50 feet of watercourses, wetland areas, and groundwater sources; use only wetland-approved herbicides near wetlands; use manual techniques for vegetation control (e.g., plant pulling)	1, 2, 3, 6, 9	3, 6
Use spot herbicidal treatments rather than broadcast applications to avoid over application and airborne drift	3, 9	3
Select herbicide products that target the plant species/assemblage of plant species you wish to control for; avoid using diesel fuel as a carrier, using mineral or other recommended oils instead	3, 9	3, 6
When using fertilizers to enrich plantation soils, opt for organic products	1, 9, 15	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Provide for a diversity of temperature conditions with access to sunshine and refuges from extreme temperatures	1, 2	3
Leave vegetation along agricultural fences, ditches and other such areas to provide cover; encourage no-till farming practices that leave large amounts of residual crop debris for extra cover	1, 15	3
Sow long-term pastures with native grasses and forbs to approximate prairie/grassland habitat	1, 2, 3, 15	3
Maintain plantation trees (e.g., pruning and cutting) during the winter months when soils are frozen to minimize disturbance and to reduce direct mortality to wildlife	6, 16	3, 6
Use groundwater to flood cranberry fields rather than diverting water from wetlands; construct holding areas rather than converting natural wetlands	1, 2, 8, 15	3
Protect the water supply feeding cave habitats	1, 8, 9	3, 6
Avoid clearing or replacing natural native vegetation around caves and springs; maintain a minimum 50 foot natural buffer	1, 2, 9	3, 6
Restrict human use of caves to the least sensitive areas; keep livestock and vehicles out of seeps and springs	1, 2, 6, 9, 15, 17	3, 6
Avoid or restrict disturbance, deforestation/clearing, dumping, chemical use, construction, roads, livestock and human access to cave (water) recharge areas	8, 9, 15, 16, 17	3, 6
Enhance cave habitats by installing entrance gates	6, 17	3
Prohibit off-road vehicle access and site roads away from caves and springs	1, 6, 9, 17	3, 6
Prohibit use of caves as refuse dumps	1, 2, 6, 9	3
Protect and restore remaining natural wetlands	1	3, 9, 20
Maintain natural water levels and fluctuations in wetlands	1, 8	3
Avoid clearing or replacing natural native vegetation along edges of wetlands, rivers and streams; maintain a minimum 50 foot buffer	1, 9	3, 6
Maintain a 500 feet or greater upland buffer around wetlands, rivers and streams	1, 2, 6, 9	3, 6
Maintain a buffer strip of natural vegetation between wetlands and agricultural areas of at least 50–60 feet	9, 15	3
Remove non-native vegetation such as purple loosestrife from wetlands	3	3, 18

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Avoid stocking into ponds persist for years without drying or altering an ephemeral wetland to make it a permanent wetland for the purpose of stocking game fish	1, 2, 3, 4, 19	3, 6, 9
Avoid excavation or damming of wetland basins to alter natural water levels and their fluctuation; create new wetlands in previously altered areas for stocking game fish or attracting waterfowl.	1, 2, 3, 4, 19	3, 6
Avoid and minimize collisions by adding wide underpasses as opposed to culverts in low points along roads, utilize seasonal road closures, or place informative signs near wetlands warning vehicles to proceed with caution near likely crossing points.	11	3, 6
Leave logs, snags and other woody debris in forests, and replace if removed	1, 16	3, 6
Minimize disturbances to soil and vegetation during forest activities such as logging by working during winter months	6, 16	3, 6
Do not clear cut forests, limit the use of monocultures (e.g., pine plantations), and maintain habitat diversity by allowing the forest understory to remain complex	1, 2, 6, 16	3, 6
Seeps, springs, rocky outcrops, ponds, and streams should all be avoided during logging; maintain a minimum 100 feet buffer around such microhabitats.	1, 2, 6, 16	3, 6
Minimize impacts from residential development by clustering homes together, maximizing forest patch size, minimizing fragmentation, and maximizing connectivity; site roads and utility corridors to reduce fragmentation and landscape with native vegetation where possible	1, 2, 20	3, 20
Protect wetlands within grasslands and savanna; control livestock access	1, 2, 6, 15	3
Promote diverse, native vegetation in grasslands and savanna	2, 3	3, 6
Avoid excess grazing and off-road vehicular traffic in grasslands and savanna	2, 6, 9, 15, 17	3
Maintain the open nature of grasslands and savanna; promote a spatially variable canopy cover appropriate for the area	1, 2	3, 6
Leave logs, snags, and other woody debris in wetlands, rivers and streams, and replace if removed	1, 2	3, 6, 9
Do not alter natural river undulations, backwater areas, or sand and gravel bars	1, 2, 8	3, 6
Limit the use of erosion control structures such as retaining walls or rip-rap on river and stream banks	1, 2, 6, 8	3, 6

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Limit livestock and motorized vehicle access to sensitive sand and gravel bars in rivers and streams; camping and day use activities such as boat landing should be limited from May to July	1, 2, 6, 8, 15, 17	3, 6
Streams should be fenced to exclude cattle and be placed outside of the vegetative buffer zone	1, 6, 8, 9, 15	3, 6
Protect exposed sand and rock habitats from heavy use	1, 6, 17	3, 6
Prevent overgrowth by shrubs and trees that would reduce the openness of exposed sand and rock habitats	1, 2	3, 6
Prevent erosion that might fill gaps between rocks in exposed rock habitats	1, 2, 15, 16	3, 6
Restrict off-road vehicle use in exposed rock and sand habitats to pre-selected, less sensitive/lower quality areas	1, 2, 8, 9, 17	3, 6
Historical water regimes should be maintained through any (urban) developmental processes	1, 2, 8, 20	3
Macrotopographic features (water (swale, meander, etc.) and the upland mounds) should make up approximately 30-50% of the area in restored or created wetlands; in wetlands with designed water levels, macrotopographic features should be 30% of the area, and in wetlands without designed water levels they should be 50% of the area	1, 2, 8	7
Vary wetland habitat mound designs to provide escape areas, denning sites, nesting opportunities, and plant diversity; side slopes for mounds should have a minimum slope of 6:1, but should be as flat as is feasible	1, 2, 8	7
Where wetland restoration sites have a designed water level, habitat mounds should vary in elevation from above to below the expected normal waterline. Approximately 1/3 of the mounds should be 6 inches to 1.0 foot below the normal water elevation, 1/3 should be 6 inches to 1.0 foot above, and 1/3 should be at the normal water elevation	1, 2, 8	7
Where wetland restoration sites do not have a designed water level, habitat mounds should mimic the natural landscape and approximately 50% of the mounds should be 0.5-1.0 foot above average ground level, and 50% should be 1.0-2.0 foot above the normal ground elevation.	1, 2, 8	7
Incorporate woody debris into wetland restoration sites to enhance microhabitats	1, 2	7, 9
Increase controls on major uncontrolled or under-controlled sources of nutrient Pollution	9	8

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Motor vehicle tire ruts can provide the shape and compaction needed to make small, linear wetlands; evaluate retaining these small wetlands in roads that are no longer driven	1, 2, 6	9
Construct restored wetlands or vernal ponds with irregular, round, or oval edges with gradual slopes to help it blend into the natural surroundings.	1, 2, 8	6, 9
Control invasive species in tidal marshes (e.g., phragmites)	3	17
Develop municipally-based strategies to manage wastewater treatment systems, develop yard waste composting sites and be involved in the Phase II planning process to ensure best management practices for municipal maintenance of streets, catch basins, and storm water management	8, 9, 20	17
Collaborate with The Nature Conservancy to better define the threats resulting from atmospheric deposition and determine what should be done to abate them	9	17
Preserve 10 coastal plain pond habitats of 10-100 acres each in eco-subregion	1	18
Preserve 4 coastal pine barren habitats of 1,000-3,000 acres each in eco-subregion	1	18
Preserve 10 maritime grassland habitats of 10-100 acres each in eco-subregion	1	18
Preserve 5 maritime dune/bluff habitats of 10-100 acres each in eco-subregion	1	18
Preserve 4 brackish tidal wetland habitats of 10-100 acres each in eco-subregion	1	18
Preserve 4 fresh tidal wetland habitats of 10-100 acres each in eco-subregion	1	18
Preserve 5 saline tidal wetland habitats of 100-500 acres each in eco-subregion	1	18
Continue to seek public and private capital for land acquisition	1, 20	18
Become engaged in local and regional land use planning at selected landscape-scale sites	1, 20, 21	18
Secure additional funding for invasive plant initiatives	3	18
Ensure the continued existence of the eleven matrix forest communities (in the Lower New England - Northern Piedmont ecoregion) and restore natural processes to promote development of mixed-aged stands	1, 2	19
Conserve multiple viable occurrences of all aquatic community types and restore hydrologic processes to promote healthy, functioning aquatic ecosystems	1, 2, 8, 9	19
Promote best available control methods to nonpoint pollution sources including sludge and industrial waste disposal; highway, urban, silvicultural and agricultural runoff; and erosion from construction sites	9, 15, 20	20
Encourage the use of soil and water conservation practices to retain agricultural productivity and to lessen the on-site and off-site impacts of erosion, sedimentation, and animal wastes	9, 15	20

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Encourage the use of less toxic pesticides and herbicides and Integrated Pest Management practices where appropriate	9, 15	20
Restore tidal flows to coves, embayments, tidal rivers, and tidal wetlands when flow control structures, such as culverts, tidal gates, and bridges need to be replaced in order to improve degraded habitat, water quality, or control of the spread of disease-threatening mosquitoes	8, 9, 10	20
Monitor current mitigation projects to determine whether wetland functions are being properly replaced; improve mitigation planning accordingly; define buffer areas adequate to protect wetlands and associated resources	1, 2, 8, 9, 20	20
Seek to achieve no net loss of wetland resources through development planning that avoids wetlands whenever possible, minimizes intrusion when it cannot be avoided, and mitigates unavoidable impacts through wetland enhancement or creation	1, 2, 5, 21	20

Species-Focused Conservation Action	Threat Addressed	Source
Herpetofaunal inventories should become a standard part of environmental assessment programs, and the publication of field survey efforts that document potential or suspected declines should be encouraged.	7	2
Support long-term monitoring of reptile populations and the establishment of standard methods and techniques.	7	2
Discourage predators by making garbage and other supplemental food sources unavailable; keep cats indoors at all times; avoid locating landfills in vulnerable areas	4	1, 16
Bog Turtle- high priority need for research into landscape-scale requirements, land-use management and stewardship programs	1, 15, 20, 21	5
Bog-Turtle - <u>Hudson/Housatonic Recovery Unit</u> . Protect 40 viable bog turtle populations and sufficient habitat to ensure the sustainability of these populations, including at least 10 populations in each of the following subunits: the Wallkill River watershed, the Hudson River watershed, and the Housatonic River watershed	7	5
Bog Turtle – augment habitat protection with habitat restoration, protection from predators, reintroduction of turtles at selected sites, and a heightened emphasis on law enforcement actions to curb illicit trade in this species	1, 4, 7, 19	5

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bog Turtle - Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands	1, 2, 8, 9, 19, 20, 21	5, 16
Bog Turtle - Develop voluntary, cooperative stewardship programs to conserve the bog turtle and its habitat on private property	1, 2, 5	5
Bog Turtle - Protect bog turtle sites through purchase and conservation easements	1	5
Bog Turtle - Conduct surveys of known, historical, and potential bog turtle habitat		5
Bog Turtle - Investigate the genetic variability of the bog turtle throughout its range		5
Bog Turtle - Reintroduce bog turtles into areas from which they had been extirpated or removed	1, 2, 5	5
Bog Turtle - Manage and maintain bog turtle habitat to ensure its suitability for bog turtles	1, 2, 5	5
Bog Turtle - Develop a strategy for evaluating bog turtle populations and managing those populations (where necessary)		5
Bog Turtle - Conduct an effective interagency law enforcement program to halt illicit take and commercialization of bog turtles	19	5
Bog Turtle - Develop and implement an effective outreach and education program about bog turtles	19	5
Sea Turtles - Identify important marine habitat	1	11, 12, 13, 14, 15
Sea Turtles - Prevent degradation and improve water quality of important turtle habitat; prevent degradation of coastal habitat from industrial and sewage effluents	9, 12	11, 12, 13, 14, 15
Sea Turtles - Prevent destruction of habitat from fishing gears, vessel anchoring, and boat groundings	1, 6, 11, 12, 13, 14	11, 12, 13, 14, 15
Sea Turtles - Prevent destruction of marine habitat from oil and gas activities	1, 6, 11, 12, 13, 14	11, 12, 13, 14, 15
Sea Turtles - Prevent destruction of habitat from dredging and disposal activities, upland and coastal erosion and siltation	1, 6, 11, 12, 13, 14	11, 12, 13, 14, 15

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Sea Turtles - Restore important foraging habitats	1, 2	11, 12, 13, 14, 15
Sea Turtles - Determine turtle distribution, abundance and status in the marine environment; maintain a carcass stranding network		11, 12, 13, 14, 15
Sea Turtles - Monitor and reduce mortality from commercial and recreational fisheries, and dredging activities; prevent oil spills, and monitor and prevent adverse impacts of oil spills and gas activities	1, 6, 11, 12, 13, 14	11, 12, 13, 14, 15
Sea Turtles - Reduce impacts from entanglement and ingestion of persistent marine debris		11, 12, 13, 14, 15
Sea Turtles - Increase law enforcement efforts to reduce poaching in United States waters; evaluate mortality from recreational and commercial motor vessels	11	11, 12, 13, 14, 15
Sea Turtles - Ensure proper care of sea turtles in captivity; ensure facilities permitted to hold and display captive sea turtles have appropriate informational displays	19	11, 12, 13, 14, 15
Sea Turtles - Provide slide programs and information leaflets on sea turtle conservation for general public	19	11, 12, 13, 14, 15
Eastern spadefoot, Green salamander, Northern diamondback terrapin, Spotted turtle, Wood turtle – Conduct monitoring studies to derive data on habitat and home range requirements, population age structure, demography, and growth; life history and ecological information; distribution and minimum population size; reproductive ecology		16
Eastern box turtle – Identify core populations and evaluate their viability with landscape studies		16
Spotted turtle, Wood turtle – Protect and manage wild turtle populations at each life stage; protect adult and sub-adult turtles during their seasonal movements between aquatic and terrestrial habitats	11	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Blue-spotted salamander, Eastern box turtle, Eastern hognose snake, Timber Rattlesnake, Northern diamondback terrapin, Spotted turtle, Wood turtle – Route new roads with care and implement ways to mitigate road mortality; installation of barriers and tunnels may mitigate for existing roads; post crossing signs	11	16
Wood turtle – Protect large habitat areas and preserves with a mosaic of different wetland types embedded within a larger matrix of intact terrestrial habitat; maintain wide corridors between populations	1	16
Eastern box turtle, Spotted turtle, Wood turtle – Reduce mortality via control of subsidized predators associated with human populations	4	16
Eastern box turtle, Eastern ribbon snake, Spotted turtle, Wood turtle – Review the effectiveness of state wetland regulations; incorporate cost/benefit analyses into the mitigation process; include species in wetland regulatory review(s)	1, 2	16
Eastern box turtle, Timber Rattlesnake, Eastern ribbon snake, Spotted turtle, Timber rattlesnake, Wood turtle – Regulate the pet trade (and excessive collection) of all amphibians and reptiles through regional efforts	19, 21	16
Blue-spotted salamander – Conduct range-wide distribution and genetic studies, establish the distribution of hybrid populations, positively identify diploid populations; study the effects of acid rain, pesticides and other toxic chemicals	5	16
Blue-spotted salamander, Eastern spadefoot, Eastern tiger salamander, Jefferson salamander, New Jersey chorus frog, Spotted turtle – Strengthen legislation to protect temporary pool breeding sites and vernal pools; preserve breeding wetlands with a 400-900-foot radius buffer of terrestrial habitat; connect individual pools and upland habitats	1, 5	16
Blue-spotted salamander – Avoid making temporary ponds deeper and permanent	2, 4	16
Eastern box turtle, Eastern spadefoot – Conduct long-term studies on the effects of habitat loss, degradation and fragmentation on survivorship of juveniles and adults	1, 2, 18	16
Eastern box turtle, Eastern mud salamander, Northern coal skink – Identify and protect stronghold defensible populations	1	16
Eastern box turtle – Integrate local human activities and address strategies to eliminate and reduce the detrimental effects of human encroachment in conservation management plans	6, 17, 19, 20, 21	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Eastern box turtle – Avoid prescribed burning during summer months	2, 3, 6	16
Eastern box turtle – Avoid and minimize use of urban catch basins, culverts, other drainage and safety structures, and low curbing	11	16
Eastern hognose snake – Design research and management around entire amphibian and reptile communities and large high quality areas that support them	1	16
Eastern hognose snake, Eastern ribbon snake, Timber rattlesnake – Initiate long-term monitoring to record movements, nesting preferences, den sites, home ranges, and to track population trends; verify historical records; firmly establish distribution data with emphasis on population sizes		16
Eastern hognose snake – Investigate the possible decline in toad populations over the past several decades; manage to protect toad populations, including the reduction of storm water drain mortality of toads in new developments, pesticide use, and traffic mortality on roads	4, 7, 9, 11	16
Eastern hognose snake – Manage and maintain abandoned sand/gravel pits in an open sandy condition; test whether species depend on such areas and whether invasive plant succession (e.g., autumn olive) effects habitat suitability	1, 2, 3	16
Eastern hognose snake, Timber Rattlesnake – Aggressively pursue public education; regulate regionally the take of all amphibians and reptiles and solidify their protection	19	16
Timber Rattlesnake – Research on life history and population ecology, home range, dispersal capability, predators, disease, demography, and habitat requirements; conduct regular monitoring of populations and habitat; research monitoring methods		16
Timber Rattlesnake – Develop restoration methods and mitigation solutions for fragmentation effects	1, 2	16
Timber Rattlesnake – Protect species habitat, especially where large-scale habitat conversions like strip-mining contribute to habitat loss	1, 2	16
Timber Rattlesnake – Use controlled burns or mechanical harvesting to prevent natural succession of woody vegetation; burn before the animals emerge from hibernation; avoid mowing when the animals are at the surface	2, 6	16
Timber Rattlesnake – Investigate repatriation at suitable historic sites	1, 5, 7	16
Eastern ribbon snake – Research contaminant levels and prey resources to assess habitat quality		16
Eastern spadefoot – Protect known breeding ponds, including agricultural depressions and other temporary water bodies; pools located near sandy soils or dry open areas are of particular importance	1	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Eastern spadefoot, New Jersey chorus frog – Investigate/conduct mosquito control as a result of the presence of West Nile Virus	10	16
Eastern spadefoot – Protect large areas of habitat and maintain a variety of shallow potential breeding sites	1	16
Jefferson salamander – Research on the effects of acid rain deposition on embryonic mortality; research selection factors for breeding pools; conduct biochemical analyses of specimens in areas where the genetic composition of populations is not known; determine variables that are key to upland habitat quality		16
Northern diamondback terrapin – Evaluate a moratorium on harvest and trade in wild-caught chelonians until sustainable harvest levels are determined	19	16
Northern diamondback terrapin – Encourage the use of turtle excluder devices on fishing set nets or traps to reduce mortality; investigate mortality due to “ghost” crab or lobster pots	13, 14	16
Northern diamondback terrapin – Protect shoreline and estuarine habitat, salt marshes; avoid dredging and channelization projects; investigating, promote, and implement cost-effective alternatives to riprap and bulkheads along shorelines	1, 2, 8, 19, 20	16
Northern diamondback terrapin – Identify and control the factors of nest mortality; evaluate dune grass management; control subsidized nest and hatchling predators; investigate effects of off-road vehicles and human presence on nest and hatchling survival in dune habitat	4, 6, 7, 11, 17, 19	16
Northern diamondback terrapin – Reduce boat propeller injury to nesting females in estuaries, possibly through no-wake zones	11	16
Northern leopard frog – Implement reciprocal state restrictions on the commercial and personal collection of this species; halt the sale of live leopard frogs immediately	19	16
Wood turtle – Incorporate aquatic and terrestrial areas used by this species in watershed management plans	1, 2, 8, 9, 11	16
Spotted turtle – Manage wetland areas for high water quality, curb plant succession every 5 to 25 years, and eradicate and prevent the invasion of exotic plants such as purple loosestrife and common reed	1, 2, 3	16
Timber rattlesnake – Establish and implement habitat protection guidelines, including size of effective preserves and allowable human use	1, 6, 17	16
Timber rattlesnake – Determine appropriate management for den site over-story and successional stage	2	16
Wood turtle – Increase enforcement of illegal collection of species during the months when turtles congregate in easily accessible streams alongside roads (particularly during early spring emergence)	19	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Wood turtle – Determine the effects of moderate development, such as low-use summer and hunting cabins along shorelines and agricultural development	6, 15, 20	16

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Conservation easements should cover at minimum the vernal pool depression and vernal pool envelope (and, preferably, the adjacent "critical terrestrial habitat")	1, 2, 20	1
Use covenants or deed restrictions to assure that the vernal pool and its envelope are conserved and that pesticide use, lot clearing, and other degrading activities are kept out of associated areas. Provisions should be included to allow a third-party, with adequate notice, to enter the property and conduct appropriate management and remediation, charging the homeowner for these services.	1, 2, 19, 20	1
In the case of a homeowner's association or other type of multiple tenant arrangement, a stewardship manual could be prepared that would educate each purchaser, or lessee, as to the unique nature of the property they are purchasing or renting, what their collective obligations to protect the resource entail, and where to obtain additional assistance or information.	1,2, 19, 20	1
The impacts of habitat degradation, introduced invasive species, and unsustainable use can be controlled through legislation and cultural shifts in environmental attitudes. Minimally, place a premium on maintaining habitats of sufficient size and quality not only for imperiled taxa but for herpetofauna in general	19	2
Emphasize acceptance by the academic community, land managers and conservation organizations that rigorous field programs focusing on the distribution, abundance, status, and trends of populations and species are critical and worthwhile	18	2
Educate the public about herpetofauna and conservation, promoting acceptance and appreciation of amphibians and reptiles by raising public awareness of conservation needs through publication and distribution of educational materials, and support of programs that use live herpetofauna	19	4
Restrict the trade of sensitive reptile species for which sustainable removal cannot be demonstrated through the passage or strengthening and enforcement of legislation	5, 7, 17, 19	2
Establish a dynamic database on the ecology and habitat requirements of amphibians and reptiles	19	4
Standardize data collection and inventory techniques	19	2, 4

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Create a user-friendly database of all management information and existing policies on herpetofauna	19	4
Establish water quality standards for nutrients in rivers, lakes, estuaries, and coastal waters; establish ambient water quality standards for nitrogen, and on a watershed-by-watershed basis identify additional nutrients and toxic pollutants for which water quality standards are needed	9, 12	8
Require watershed-based water quality compliance planning	8, 9	8
Provide a complementary suite of incentives for improving water quality and disincentives for activities that harm water quality	9	8
Municipalities and counties should change their zoning and subdivision codes to promote compact growth near urban centers, to discourage growth outside town centers in rural areas, and to reduce impervious surface cover wherever possible	8, 9, 20, 21	8
Require local growth-management planning as a condition for receipt of state and pass-through federal development assistance, and ensure that state and local growth and transportation planning comport with statewide habitat protection plans	20, 21	8
Coordinate policies and practices among local jurisdictions and, to the extent possible, with adjacent states to ensure a rational regional approach to growth management	20, 21	8
Fund development of biological nutrient removal technology standards to reduce nitrogen loads from publicly owned treatment works and for municipalities to install biological nutrient removal treatment in watersheds where such loads are a significant source of water quality impairment	9	8
Develop an inventory of existing species and their historical abundance for each regional marine ecosystem		8
Evaluate requiring the utilization of best available sound control technologies, where the generation of sound has potential adverse effects	9	8
Support the study of the effects of toxic substances in the marine environment	9, 10	8
Induce pride in communities for rare or “special” species they have	19	10
Provide information on species and management needs for land managers and/ or land control boards; organize regional land manager workshops, symposia, and other opportunities for information sharing; develop and maintain a strong research/ management connection and information exchange; assimilate and disperse management information	19	10
Promote the idea that habitat corridors are valuable	19	10
Interface with fish stocking activities, bait industry, pet trade, horticulture, and other sources of invasive species; interface with regional regulatory groups	19	10

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Identify and account for consumptive/commercial uses of herpetofauna and elements of their habitat (cultural uses, subsistence, recreational, scientific, commercial); compile/update all laws, regulations, and permit requirements	17, 19	10
Identify regional cumulative environmental pollution threats to herpetofauna and their habitats	9, 21	10
Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic habitat	19	20
Continue education and training for appointed and elected volunteers at the municipal level who oversee wetland regulation; improve guidance to better integrate wetland protection with surrounding upland areas and from impacts of stormwater management practices	1, 2, 9, 19, 20	20
Educate local decision-makers on how to deal adequately with nonpoint sources of pollution. Focus on the reduction of impervious surfaces, reduce blacktop and sidewalks, whenever feasible	9	20
Enhance the public’s understanding of resource conservation and natural diversity, and foster beneficial land use practices through educational programs and demonstration areas	19	20
In development projects, seek to avoid significant impacts to essential fish and wildlife habitats and migration corridors	20, 21	20
Minimize publicity of biologically significant areas to prevent poaching or indiscriminate killing	19	6
Provide conservation-related educational materials to boaters, fishermen, hunters, loggers, hikers, campers, farmers, and other people who regularly interact with the outdoors; discourage field personnel and recreational visitors from shooting turtles, killing snakes, etc.	19	6

**FISH: Compilation of Conservation Actions for Connecticut
from Existing Management Plans and Literature**

Source Codes:

- 1 = AFS Policy Statement 31a: Protection of Marine Fish Stocks at Risk of Extinction
- 2 = AFS Policy Statement #31b: Management of Sharks and Their Relatives (*Elasmobranchii*)
- 3 = AFS Policy Statement #31c: Long-lived Reef Fishes: The Grouper-Snapper Complex
- 4 = Musick et al. (2000): Marine, Estuarine and Diadromous Fish ... at Risk of Extinction
- 5 = Williams et al. (1989): Fishes of North America Endangered, Threatened ...
- 6 = Pew Oceans Commission: Boesch et al. (2001) Marine Pollution in the United States
- 7 = Pew Oceans Commission: Dayton et al. (2002) Ecological Effects of Fishing
- 8 = Pew Oceans Commission (2003): America's Living Oceans: Charting a Course for Sea Change. A Report to the Nation, Recommendations for a New Ocean Policy
- 9 = Pew Oceans Commission: Beach (2002) Coastal Sprawl – Effects ... on Aquatic Ecosystems
- 10 = Carlton (2001): Introduced Species in U.S. Coastal Waters: Environmental Impacts and Management Priorities
- 11 = NEFMC (1998): Essential Fish Habitat
- 12 = NOAA (2002): Status of U.S. Fisheries – 2001
- 13 = ASMFC (1991): Interstate Fisheries of the Atlantic Coast
- 14 = Jacobs and O'Donnell (2002): A Fisheries Guide to Lakes and Ponds of Connecticut
- 15 = 2003 Connecticut Angler's Guide
- 16 = NEES&WDTC (draft)
- 17 = The Nature Conservancy (comment letter of October 27, 2003)
- 18 = TNC (1999): North Atlantic Coast Ecoregional Conservation Plan
- 19 = TNC (2003): Lower New England – Northern Piedmont Ecoregional Conservation Plan
- 20 = CT OPM (1998): Conservation and Development Policies Plan for Connecticut, 1998-2003
- 21 = Wahle and Balcom (2002): Living Treasures: The Plants and Animals of Long Island Sound
- 22 = CT DEP (1984): Marine Resources Management Plan for the State of Connecticut
- 23 = Long Island Sound Study 1994 Comprehensive Management Plan
- 24 = Long Island Sound Study 2003 Plan
- 25 = Jacobs et al. (1999): A Management Plan for Bass in Connecticut Waters and Recommendations for Other Warmwater Species
- 26 = Hyatt et al. (1999): A Trout Management Plan for Connecticut's Rivers and Streams

- 27 = CT DEP Marine Fisheries Recommendations, March 22, 2004
- 28 = NMFS, Atlantic Sea Herring (*Clupea harengus harengus*) FMP (1999)
- 29 = CT DEP (2001): The Connecticut Green Plan: Open Space Acquisition, Fiscal Years 2001-2006

Threat Addressed by Conservation Action Codes:

- 1 = Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction project, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)
- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in Long Island Sound and Estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)
- 20 = Unplanned urban development and growth (lack of landowner incentives, inability to control or influence private land development under local jurisdiction, lack of information to municipalities, population growth, changing economy, etc.)
- 21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Commit to protecting entire ecosystems rather than inconsistent recovery efforts for individual species; promote intraspecies preservation and landscape level conservation	1, 2, 7	5, 7, 8
Prepare an up to date inventory of anadromous fish runs incorporating EFH mapping and designations and develop a strategy to prioritize, restore, and maintain these runs	1, 5, 7	11
Conduct aquatic ecoregional planning for pond, lake, estuarine, and marine systems	1, 21	19
Implement site conservation plans with detailed analysis of internal targets, key ecological factors, threats, and strategies for aquatic portfolio examples	1, 21	19
Control multiple sources of nutrients and contaminants on watershed scales through a mix of voluntary and mandatory approaches and hybrids of these two extremes; use geographically-targeted governmental incentives such as tax benefits and subsidies and disincentives	9	6
Develop municipally-based strategies to manage wastewater treatment systems, develop yard waste composting sites and be involved in the Phase II planning process to ensure best management practices for municipal maintenance of streets, catch basins, and storm water management	8, 9, 20	17
Promote BMPs to nonpoint pollution sources including sludge and industrial waste disposal; highway, urban, silvicultural and agricultural runoff; and erosion from construction sites	9, 15, 20	9, 11, 19, 20, 23
Encourage the use of soil and water conservation practices to retain agricultural productivity and to lessen the on-site and off-site impacts of erosion, sedimentation, and animal wastes	9, 15	9, 11, 19, 20
Encourage the use of less toxic pesticides and herbicides and Integrated Pest Management practices where appropriate	9, 15	9, 20
Require more demanding treatment standards where water quality is seriously impaired than those generally applicable; encourage technological innovations	9	6
Evaluate capping and removal options for management of isolated sites with extremely high concentrations of toxicants in bottom sediments	9	6
Reduce agricultural sources of nutrients through improved practices and watershed restoration	9	6, 9, 11
Capture and treat marine pollutants (e.g., phosphorous) using BMPs, raising the threshold of degradation above ten percent	9, 20	9
Use regional watershed protection plans to guide development patterns locally	1, 2, 9, 20	9, 23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Identify watersheds that are less than 10 percent impervious and attempt to maintain most of them in an undeveloped state; encourage use of on-site stormwater practices, buffers, new paving techniques, reduced automobile dependency, and other reforms at the neighborhood and site levels	1, 2, 9, 20	9
Collaborate with The Nature Conservancy to better define the threats resulting from atmospheric deposition and determine what should be done to abate them	9	17
Closely monitor and strictly enforce aquaculture and processing operation discharge levels	8, 9	11
Update and implement coast-wide area contingency plans (collaborating with the USCG) and incorporate EFH mapping in response planning for oil spills and other hazardous substance releases; prioritize clean-up plans to protect known areas of high productivity (e.g. HAPC)	1, 5, 8, 9	11
Develop contingency plans for addressing oil spills in rivers (particularly rivers designated as HAPC for Atlantic salmon), estuaries, and other inshore habitats	1, 5, 8, 9	11
Identify nitrogen sensitive embayments containing EFH; determine critical loading rates and recommend actions to prevent or reduce excessive nitrogen and phosphorous loading	1, 5, 9	11
Prevent or reduce nitrogen loading by discouraging or banning the use of lawn fertilizers, requiring denitrifying systems on septic systems and nitrogen removal by wastewater treatment facilities, protection of vegetated buffer zones and wetlands surrounding rivers and estuaries, protection of open space, use of catch crops by agriculture industries to reduce the amount of nutrient rich run-off between growing seasons, and development limits	9	11, 21
Strengthen enforcement of sewage discharge permits (e.g. NPDES) and ensure proper maintenance and operation of septic systems near nitrogen-sensitive coastal embayments containing EFH	9	11
Inventory and monitor potential polluting activities	9	20
Promote coordination between land use commissions and water utilities by encouraging the consideration of watershed surveys and water utility recommendations during the review process when considering the permitting of new land uses that may cause pollution in aquifer areas and watersheds	8, 9	20
Continue to prohibit the use of streams for both drinking water and sewage disposal except in water supply emergencies when appropriately treated and approved by the Commissioner of Public Health	8, 9	20
Continue emphasis on the use and timely application of vegetative and nonstructural measures for both short- and long-term soil stabilization	8, 9	20

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Continue to maintain the quality of those waters already at a high standard; reclassify groundwater if polluted by past intense urban, commercial, or industrial development	9	20
Continue to implement and enhance a stormwater discharge program; improve stormwater management by use of natural systems, such as grass swales, minimizing impervious surfaces, and groundwater recharge	8, 9, 20	20
Determine the ecological conditions and health of the 105 significant recreational lakes in Connecticut; support state and local efforts to restore lakes and ponds	1, 9	20
Monitor underground storage tanks to prevent contamination; design a pilot program to promote the removal of residential underground storage tanks by educating homeowners to the potential risks; investigate mechanisms to provide financial support and/or incentives for homeowners who replace their existing underground tanks	9	20
Collaborate with partners to design and implement beach and marine debris reduction programs to reduce the threat of debris impacting EFH	9	11, 23
Adopt and implement a policy to not allow any net loss of wetlands; consider wetlands banking as a tool	1	11, 20
Facilitate the restoration of salt marshes and other estuarine habitats to promote the recovery of fishery resources and enhance EFH (e.g., Massachusetts Wetlands Restoration and Banking Program)	1	11
Adapt wetland regulations to allow the streamlining of legitimate restoration projects for quick and thorough protection and enhancement of EFH	1	11
Restrict otter trawling to certain, defined banks and grounds	1, 5, 6, 13, 14	7
Use marine zoning to designate areas that allow fishing and other areas that provide for various levels of protection from such disturbances	1, 5, 6, 13, 14	7
Prohibit the use of mobile bottom fishing gear in habitat areas known to be especially sensitive to disturbance from such gear, including but not limited to coral-reef and deepwater coral habitats, complex rocky bottoms, seamounts, kelp forests, seagrass beds, and sponge habitats	1, 6	8
Prevent expansion of mobile bottom gear into geographical areas where it is not presently employed	1, 2, 6, 21	8
Implement a zoning regime (over a 5 year transition) that limits bottom trawling and dredging to only those areas where best available science indicates that such gear can be used without altering or destroying important or significant amounts of habitat; and closes all other areas to these fishing practices	1, 2, 6, 21	8

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Site at-sea aquaculture and fish processing facilities in the least environmentally harmful locations; consider EFH designations in the development and construction of any aquaculture and processing operation; discourage these activities in HAPC	1, 14	11
Incorporate EFH mapping in siting proposed dredging locations and disposal sites	1, 2, 6	11
Coordinate the development of a comprehensive dredging and dredged material disposal plan to improve and maintain access to ports, harbors, and channels, and to minimize adverse impacts to EFH	1, 2, 6, 21	11
Restrict timing of dredging of channels or dredged material disposal to avoid impacting EFH of migratory fish (e.g. Atlantic salmon), spawning fish (e.g. winter flounder), or critical life stages (e.g. larval and juvenile fishes)	1, 5, 6, 7	11
Avoid designated EFH for new dredging or disposal sites; attempt to minimize environmental impacts in surrounding areas; for channels subjected to maintenance dredging, evaluate an alternative analysis to determine if these channels have become HAPC since the last time it was dredged to consider mitigating impacts to EFH	1, 2, 5, 6	11
Investigate the feasibility of creating artificial reefs or other habitats in appropriate areas, and the potential for increasing the abundance of marine fishery resources in such areas	1	22
Identify and then acquire critical parcels of land whose acquisition would protect coastal and riverine EFH by preventing any dredging and filling operations (e.g., areas surrounding anadromous fish spawning habitats, buffer zones around coastal wetlands, the coastal wetlands themselves, and natural corridors adjacent to rivers where anadromous fish run)	1	11
Regulate construction and maintenance of marina and dock facilities so that EFH is not degraded either by the structures themselves or by the vessel activity they engender	1	11
Encourage use of new mooring technology (e.g., Helix and Manta Systems) to minimize impacts of mooring use and minimize the chain dragging on the bottom which damages submerged vegetation and other EFH benthic features	1, 6	11
Encourage municipalities to adopt harbor management plans to protect EFH (e.g., site new and expanded marinas and docks in least environmentally damaging areas, reduce the overall footprint of marinas and docks, emphasize community piers accessible to all residents and maritime businesses)	1, 2, 5, 6, 20, 21	11
Avoid siting boat channels over shallow EFH (e.g. submerged vegetation habitats)	1, 5, 6, 9	11

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Integrate EFH mapping and develop methods to reduce degradation of coastal marshes, erosion of submerged aquatic vegetation beds, and siltation of shellfish flats to minimize vessel-induced impacts; encourage local harbormasters to educate vessel owners about no wake zones	1, 5, 6, 9	11
Design and site bulkheads, seawalls, jetties, groins, and other erosion control structures to avoid creating any impacts on EFH, such as interrupting the natural flow of sand to EFH	1, 2, 8	11
Avoid construction of structures such as seawalls that hamper the long-term functioning of vital coastal resources	1, 2, 8	20
Incorporate EFH mapping into existing erosion control programs and adopt and implement strict development/redevelopment standards within the Federal Emergency Management Act A and V flood hazard zones and other areas subject to coastal flooding, erosion, and sea level rise; develop effective local floodplain management regulations that consider EFH	1, 20	11
Require the maintenance of naturally vegetated buffer strips around coastal wetlands, rivers, and anadromous fish spawning sites that have been designated as EFH	1, 8, 9	11
Restore and protect riparian habitats by limiting grazing, promoting buffer strips, and restricting or promoting compatible development near stream and lake margins	1, 8, 9, 15, 20	19
Define the proper buffers needed to protect wetlands and associated resources	1, 8, 9, 20	20
Adopt a policy that any construction project, including public works projects, within or adjacent to EFH will not restrict the tidal flow or alter freshwater inflows in any way	1, 8	11
Identify dams that are no longer functional and are therefore candidates for removal; modify regulations that hinder the removal of such dams when removal is in the best interest of enhancing EFH for anadromous species and protects other environmental interests	1, 2, 8	11, 19
Establish natural flow regimes in rivers by removing unneeded structures and modifying dam operations to resemble natural flow patterns	1, 2, 8	19
Reconnect stream reaches and drainage networks by removing impoundments, removing unneeded culverts, or creating structures to allow the passage of organisms and organic nutrients	1, 2, 8	19
Remove flood-control structures in appropriate areas to allow for reestablishment of floods and maintenance of floodplain communities	1, 2, 8	19
Prevent inappropriate development in flood plains by undertaking state plans and projects in accordance with statutory provisions	8	20

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Restore channelized streams to their original forms	1, 2, 8	19
Restore tidal flows to coves, embayments, tidal rivers, and tidal wetlands when flow control structures, such as culverts, tidal gates, and bridges need to be replaced in order to improve degraded habitat, water quality, or control of the spread of disease-threatening mosquitoes	8, 9, 10	19, 20
Avoid creating impoundments in tidal areas	1, 2, 8	11
Integrate EFH mapping into existing or developing water management programs; develop/ promote using river basin plans to facilitate responsible water resource planning and management	1, 2, 8	11
Incorporate provisions that EFH should not be degraded in standards for water withdrawals	1, 8	11
Conserve multiple viable occurrences of all aquatic community types and restore hydrologic processes to promote healthy, functioning aquatic ecosystems	1, 2, 8, 9	19
In cooperation with the Department of Public Health, formulate a water allocation policy for the DEP and agree upon an instream flow standard	8, 9, 10	20
Require performance standards of mining operations (e.g. oil and gas, peat) include a provision not to alter EFH	1, 6, 8, 9	11
Prohibit any mining in HAPC	1, 6, 8, 9	11
Consider and incorporate EFH in any plans to develop artificial reefs; construct artificial reefs with materials that do not adversely impact EFH	1, 6, 7	11
Prohibit mining that alters the sedimentary composition (e.g. sand and gravel) or other important environmental features (e.g. depth) from any area designated as EFH for demersal species or organisms with demersal life stages	2, 6, 8, 9	11
Control invasive species in tidal marshes (e.g., phragmites); modify state wetland regulations to facilitate restoration projects	3	11, 17
Develop statewide invasive species management plans that include provisions for inventorying, monitoring, and rapid response; support federal funding for such state plans	3	8
Secure additional funding for invasive plant initiatives	3	18
Support advanced research and development to explore and implement ballast water treatment methods, other than open-ocean ballast exchange	3	10
Regulate the intentional release of live non-native marine organisms, coordinating efforts with adjacent states, the USFWS and the NMFS	3	10

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Regulate the interstate transport of live marine organisms, coordinating efforts with adjacent states, the USFWS and the NMFS	3	10
Develop an early-warning invasions system and mount a strike force (in coordination with USFWS and NMFS) to eradicate new populations of marine introductions	3	10
Spend significantly more on training and support for marine systematics and taxonomy to correctly recognize new species introductions	3, 18	10
Regulate research projects, biotechnology laboratories, and aquariums to ensure that reared organisms do not escape or are not intentionally released without strict guidelines	3, 19	11
Initiate a program to reduce the threat of nuisance / toxic algae and pathogens from spreading spatially and temporally that may impact fishery resources and EFH	3	11, 23
Become engaged in local and regional land use planning at selected landscape-scale sites	1, 20, 21	18
Facilitate land protection and implementation of regional and town programs to abate threats to the Natchaug River Watershed river system	1, 2, 6, 8, 20, 21	17
Improve fish passage (e.g., dam removals) in the Pawcatuck Borderlands Project, Eightmile River Project and Northwest Highlands Project landscapes	1, 2, 8	17
Control invasive plants at tiger beetle site on the Salmon River	3, 5, 7	17
Promote best management practices to mitigate road-related threats in Salmon River Project area; ensure that state lands are managed for integrity of conservation targets, as well as for forestry and recreation	6, 8, 9	17
Support designation of the Eightmile River as a Congressional Wild and Scenic River; encourage the Governor's office to support the designation	1, 6, 19	17
Protect the top 25 land parcels in the Eightmile River Project landscape	1, 2, 6	17
Continue to implement and monitor the phragmites control projects at Lord Cove and Lieutenant River tidal marsh	2, 3	17
Identify and implement an overall phragmites control and periodic maintenance strategy for the Lower Connecticut River as a whole	2, 3	17
Dedicate higher level staff to follow and contribute to the Eightmile Wild and Scenic Study, and explicitly integrate the Eightmile Study into current DEP initiatives and projects	18	17
Support formation of a watershed association in the Saugatuck Forestlands Project landscape that would enhance public interest in and stewardship for the river and its tributaries	19	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Survey the Saugatuck Forestlands Project landscape waterways to identify potential dams for removal or fish ladder installation to improve length of anadromous fish runs	1, 2, 8	17
Establish greater water volume releases from reservoirs on the Saugatuck in the lower watershed	8	17
Conduct surveys of invasives within the Saugatuck project area; prioritize removal efforts and establish land management plans to keep ahead of the spread of invasive	3	17
Contain and eliminate (with Massachusetts and EPA) the polychlorinated biphenyl problem throughout the state and specifically in the Housatonic River by the examination of biological life, analysis of sediment transport, consideration of bottom removal, and possible bioremediation	9	20
Participate in the development of and support strategies being developed by federal, state, and local interests for the Quinebaug and Shetucket Heritage Corridor, the Farmington River, and the Connecticut River		20
Limit projects within scenic and recreational river corridors or Protected River corridors to those that restrict structural development to the least scenic areas or to areas already significantly altered; prohibit clearing of wetland and watercourse vegetation and revegetate scenic areas that are denuded; screen visible structures; and retain right of access and control unauthorized access to potential recreational areas	8, 9, 16, 17, 20, 21	20
Examine finfish species utilization of the Connecticut River estuary with particular emphasis on the endangered shortnose sturgeon and threatened Atlantic sturgeon, tomcod (potential species of concern), as well as dominant species including striped bass and white perch	7	27
Monitor the condition of prime shellfish production areas; regulate the harvest of shellfish species from natural beds under state jurisdiction; work with town officials on shellfish law enforcement	5, 10, 12, 14	20
Promote Connecticut's commercial and recreational fishing and aquacultural industries consistent with marine productive capacities	5, 14, 17	20
Work toward elimination of shellfish closure areas by upgrading water pollution control facilities and reducing non-point sources of pollution	9, 10, 12	20, 24
Continue participation in the Long Island Sound Study and promote the implementation of its recommendations	1, 2, 3, 8, 9, 10, 12, 19, 20	20
Establish a nitrogen reduction schedule and targets for all Long Island Sound management zones and allocate loads among the individual discharges via permit limit	9, 12	20

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Continue to test and promote a drainage basin approach to comprehensive nonpoint source management, utilizing existing programs and authorities; plan, design, and implement a coastal nonpoint source program in cooperation with NOAA, EPA, regional, and local interests	9, 12	20
Develop contaminated sediment clean up standards and a strategy for action with federal assistance from EPA	9	20
Update and refine the plan for the management of dredged material disposal in LIS	1, 2, 8, 9	20
Focus on non-structural solutions to flood hazard mitigation	1, 2, 8, 9	20
Continue and enhance existing floatable debris education and cleanup efforts, particularly in municipalities that have combined sewer overflows or storm sewers discharging into LIS or its tributaries	1, 9	23
Maintain existing dissolved oxygen levels in waters that currently meet state standards	12	23
Increase dissolved oxygen levels to meet standards in those areas below the state standards but above 3.5 mg/l	12	23
Increase short-term average dissolved oxygen levels to 3.5 mg/l in those areas currently below 3.5 mg/l, ensuring that dissolved oxygen never goes below 1.5 mg/l at any time	12	23
Fully implement the Coastal Zone Management Plan	1, 2, 9, 12, 20	20, 23
Reduce impacts from existing development through nonpoint source management, including public education, infrastructure upgrades, spill prevention and response, and flood and erosion control; prioritize abandoned or underutilized sites for remediation and reuse	1, 2, 9, 12, 19, 20	23
Enhance existing state and federal programs to manage and restore populations of harvestable and endangered and threatened species; reestablish migratory finfish passage	1, 7, 8	23
Develop site-specific management plans for each harbor, embayment, or discrete shellfish bed area; conduct site-specific surveys leading to better control of local sources of pathogens	9	23
Continue and, where appropriate, enhance existing regulatory and pollution prevention programs to reduce toxic substance inputs to Long Island Sound	9	23
Further evaluate sediments where toxic contamination problems exist to determine the feasibility of remediation	9	23
Improve communication to the public of any legitimate health risks from consumption of seafood species from the Sound	9	23

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Coordinate and strengthen monitoring activities for toxic substances to improve understanding and management of toxic contamination problems	9	23
By 2003, nominate vessel no-discharge areas for the Pawcatuck and Mystic Rivers in Connecticut; by 2005, nominate vessel no-discharge areas in two additional areas in Connecticut	9, 10	24
By 2010, decrease the acreage closed year-round to shellfishing due to pathogen indicators by 10 percent compared to 2000 levels	9, 10	24
Complete the mapping of eelgrass in LIS to determine trends; continue to promote investigations and research into determining the impacts of nitrogen upon the degradation of aquatic habitats (i.e., loss of eelgrass, increases in macroalgae and benthic algae) in shallow embayments and bays in LIS	1, 5, 9, 12	24
By 2005, characterize the scope and rate of tidal wetland losses in LIS; promote research to determine to what degree accelerated sea level rise, sediment supply disruptions, or other factors are responsible for the loss of habitat	1, 5, 8, 9, 12	24
Restore at least 2000 acres of habitat and 100 river miles for fish passage (in the LIS watershed) during 1998 to 2008 and monitor these sites to confirm restoration progress over time	1, 2, 8	24
Examine the abundance and distribution of benthic macroinvertebrates and evaluate their importance as food source for fish	1, 5, 7	27
Continue state land protection initiatives to acquire ecologically and recreationally significant properties along the coast and increase public access opportunities to shoreline locations		22, 24
Inventory and assess the distribution and habitat quality of rocky reef, kelp, sponge, shell, sand wave and eelgrass habitat in Long Island Sound and adjacent estuaries	1, 5	27
Identify and acquire critical parcels of land that would protect coastal EFH through the prevention of deforestation (e.g., land surrounding anadromous fish spawning habitats, buffer zones around coastal wetlands, the coastal wetlands themselves, and natural corridors adjacent to rivers where anadromous fish run)	1	11, 19
Preserve 10 coastal plain pond habitats of 10-100 acres each in eco-subregion	1	18
Preserve 4 brackish tidal wetland habitats of 10-100 acres each in eco-subregion	1	18
Preserve 4 fresh tidal wetland habitats of 10-100 acres each in eco-subregion	1	18
Preserve 5 saline tidal wetland habitats of 100-500 acres each in eco-subregion	1	18
Continue to seek public and private capital for land acquisition	1, 20	18

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Preserve 90 water access sites of 100 acres each, and 50 sites of ~20 acres (totaling 10,000 acres in the state)		29
Develop a coordinated strategy to inventory and prioritize coastal habitat restoration and enhancement needs; cooperatively implement restoration programs using all available state and federal resources	1	23

Species-Focused Conservation Action	Threat Addressed	Source
Give priority to management of species identified (by AFS and others) as extraordinarily vulnerable, or at risk of extinction	7	1
Monitor bycatch of long-lived species; implement conservation actions (e.g., marine reserves) if population declines are documented	13, 14	1, 7
Recognize invertebrate marine species as DPSs in management	7	1
Use a more precautionary approach to managing DPSs potentially at risk (e.g., Candidate species) by affording protection or remedial action before populations are reduced to the point of being threatened or endangered	7	1, 4
Give shark and ray management high priority due to their slow population growth, and their resulting vulnerability to overfishing and stock collapse	14	2
Support management of sharks through regional management organizations	7	2
Mandate release of sharks and rays taken as bycatch in a survivable condition; establish precautionary quotas on bycatch species	13	2
Support the development and implementation of management plans for shark and ray species; plans should err in favor of maintaining the health of the resource rather than fostering short-term economic gains	7, 13, 14, 19	2
Avoid recruitment overfishing of sharks and rays by establishing precautionary quotas and size limits that guarantee recruitment	7, 14	2
Mandate full utilization of shark carcasses and prohibit the wasteful practice of finning; encourage landing carcasses (bled and gutted) with the fins intact in all fisheries taking sharks	7, 14, 19	2
Increase report precision by avoiding lumping several shark and/or ray species together in generic categories in fishery statistics programs; separate species in reporting	7	2
Maintain mortality of long-lived reef species at or near natural mortality rates	7	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Use conventional fishery management modeling methods with caution for long-lived reef species due to their protogynous hermaphrodite life history (creating a potential imbalance in the normal sex ratio)	7, 14	3
Protect seasonal spawning aggregations of reef species	7, 14	3
Develop Marine Protection Areas and individual transferable quotas in addition to conventional management techniques for reef species and their habitats	1, 7, 14	3
Manage reef species as 'complexes' of species to prevent mortality during harvest of co-existing (non-restricted) species	7, 13, 14	3
Limit size limits and species prohibition management tools to shallow-water species; use other management tools for deeper water species such as snappers and groupers, which are either already dead or moribund when captured	7, 13, 14	3
Preferentially use marine reserves or Marine Protected Areas (MPAs), spatially restricted absolute no-take zones, particularly when accompanied by reduced TAC to preclude effort shifts, for management of reef species	7, 14	3, 8
Reduce mortality of: Atlantic sea scallop, Cod, Haddock, White hake, American plaice, Monkfish, Spiny dogfish, Summer flounder, Scup, Black sea bass, Golden tilefish, Blue marlin, White marlin, Bigeye tuna, Bluefin tuna, Swordfish, Sailfish, and Albacore	7, 14	12
Continue rebuilding stocks of Yellowtail flounder, White flounder, Silver hake, Atlantic halibut, Winter flounder, Monkfish, Spiny dogfish, Summer flounder, Black sea bass, Bluefish, Golden tilefish, King mackerel, Bluefin tuna, and Swordfish	7, 14	12
Reduce mortality and continue rebuilding for sharks: Sandbar shark, Blacktip shark, Spinner shark, Silky shark, Dusky shark, Bull shark, Bignose shark, Narrowtooth shark, Galapagos shark, Night shark, Caribbean reef shark, Tiger shark, Lemon shark, Sand tiger shark, Bigeye sand tiger shark, Nurse shark, Scalloped hammerhead shark, Great hammerhead shark, Smooth hammerhead shark, Whale shark, Basking shark, White shark	7, 14	12
Bass -- Maintain the statewide 12-inch minimum length limit and 6-fish creel limit on black bass within the majority of Connecticut waters	7	25
Bass -- Create 22 additional Bass Management Lakes and six "Trophy Bass Management Lakes" through implementation of alternative length and creel limit regulations on bass	17	25

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bass -- Expand efforts to monitor Connecticut warmwater fish populations; sample lakes and ponds by electrofishing on an ongoing basis; monitor trends in bass population structure and tournament fishing success	7, 17	25
Bass -- Investigate the potential benefits of stocking bass from unfished reservoirs into public lakes	7, 17	25
Bass -- Determine the success and effects of introducing new predatory gamefish to Connecticut lakes and ponds	4, 7, 17	25
Evaluate alternative management measures for chain pickerel, panfish	7	25
Monitor the effects of habitat manipulation or exotic species introductions on warmwater fish populations	1, 2, 3, 4, 7	25
Recommend that Connecticut water companies consult with the Fisheries Division prior to opening any reservoir to public fishing	14, 17	25
Trout -- Maintain the current level of opportunity to fish for stocked trout in streams in all regions of the state	7, 17	26
Trout -- Continue to manage seven stream sections as Fly-Fishing-Only areas	7, 17	26
Trout -- Continue to manage five stocked stream sections (with modified regulations) as seasonal catch-and-release/delayed harvest areas	7, 17	26
Trout -- Maintain current year-round catch-and-release management on five stocked stream sections	7, 17	26
Trout -- Continue to manage a section of the Tankerhoosen River as a Wild Trout Management Area	7, 17	26
Trout -- Continue to monitor streams where habitat and water quality are improving to determine if trout can be stocked; stock trout if conditions warrant	1, 7, 9	26
Trout -- Improve put-and-take trout fisheries by adjusting stocking density and species mix to meet site-specific objectives (e.g., increased return rates, higher initial catch rates, increased duration of the fishery)	7, 17	26
Trout -- Create two additional seasonal catch-and-release/delayed harvest areas	7, 17	26
Trout -- Create one additional year-round catch-and-release area	7, 17	26
Trout -- Develop Trophy Trout Fisheries on 5-8 stream sections having suitable habitat conditions, which are distributed among all regions of the state, by stocking large trout; reduce the creel limit to provide a more equitable distribution of fish among anglers	7, 17	26
Trout -- Create Trout Parks on four to six stream/pond areas located on easily accessible DEP controlled property and distributed among all regions of the state, by increasing the frequency of stocking	7, 17	26
Trout -- Create Intensive/High Yield Areas on five stream sections distributed among all regions of the state by increasing the frequency of stocking	7, 17	26

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Trout -- Develop and implement a Wild Trout Fisheries Program including up to 17 stream sections having suitable habitat and wild trout populations by implementing site-specific regulations to control harvest; no stocking will occur in order to maximize wild trout numbers	7, 17	26
Trout -- Develop Wild/Put-and-Grow Trout Fisheries on up to 26 stream sections having suitable habitat and wild trout populations by implementing site-specific regulations, and by supplementally stocking fry, fingerling, and yearling trout	7, 17	26
Trout -- Develop experimental Sea-Run Trout Fisheries in 3 coastal streams having suitable habitat by stocking fry, fingerling, and/or yearling Seeforellen brown trout and by protecting the young trout with minimum size limits	7, 17	26
Trout -- Create a new trout stream designation, Blue Ribbon Trout Waters, and apply it to streams which are capable of supporting significant numbers of large holdover trout	7, 17	26
Trout -- Develop and implement an evaluation and assessment protocol for the trout management program which includes annual data collection and analysis, and a five-year program review		26
Coastal sharks. Investigate areas for possible pupping locations, examine seasonal presence and abundance of sharks along the north shore of Long Island Sound	5, 7	27
Tomcod/Rainbow smelt. Inventory stock size and presence by area; determine if reported stock declines are related to chlorinated effluents from sewage treatment plants	7, 9	27
Shortnose sturgeon. Determine the extent of seasonal usage of the estuary and Long Island Sound. Examine mortality from bycatch in the shad gillnet fishery.		27
Investigate whether striped bass are spawning in the Connecticut River; evaluate the ecological implications for the river including displacement of other species and increased predation		27
Striped bass. Examine implications of expanded coastal stock of striped bass on selected forage species in Connecticut waters		27
Menhaden. Investigate the location and extent of spawning in Connecticut waters/Long Island Sound. Estimate approximate annual stock size of immature menhaden and determine their ecological significance in the predator biomass they could support		27
Inventory fish and lobster spawning grounds throughout Long Island Sound using larval and/or juvenile surveys and assess the relative importance of areas potentially impacted by anthropogenic activities		27
Hickory Shad. Determine annual abundance, habitat preferences and seasonal movements		27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Tautog. Determine fidelity of fish to individual sites through tagging and telemetry. Perform independent assessment of fecundity and determine egg deposition rates. Examine egg and larval mortality of discrete areas		27
Tautog. Determine spawning and over-wintering sites of this resident species and describe associated habitat		27
Winter flounder. Determine spawning sites and describe associated habitat of this estuarine spawner		27
Atlantic sea herring -- Develop a long-term strategy for assessing individual spawning stocks as a basis for more effective management of any heavily exploited portions of the stock complex; evaluate the merits of acoustic surveys and other techniques to achieve sub-stock complex monitoring		28
Atlantic sea herring -- Pursue the development of a dedicated pelagic survey technique utilizing hydro-acoustic and trawling methods to provide another direct and independent means of estimating stock size		28
Atlantic sea herring -- Reinvestigate the estimation of age-3 herring, the natural mortality rate assumed for all ages, the use of catch-per-unit-effort tuning indices, and the use of NEFSC fall bottom trawl survey tuning indices in the analytical assessment of herring		28
Atlantic sea herring -- Conduct a retrospective analysis of herring larval and assessment data to determine the role larval data plays in anticipating stock collapse and as a tuning index in the age-structured assessment		28
Atlantic sea herring -- Investigate alternative methods of estimating mean weight at age used to determine the age composition of U.S. and Canadian landings from the coastal stock complex		28
Atlantic sea herring -- Evaluate the concept of a minimum biologically acceptable level biomass (MBAL) for the herring coastal stock complex. Determine the adequacy of present methods and data to determine MBAL if appropriate		28
Atlantic sea herring -- Evaluate the concept of a fixed spawning stock size or spawning target for the herring coastal stock complex. Determine the adequacy of present methods and data to set a target if appropriate		28
Atlantic sea herring -- Investigate the effects of averaging maturity rates over blocks of years to help smooth some of the inter-annual variability in the calculation of spawning stock biomass		28
Atlantic sea herring -- Consider potential discards if fishing mortality increases in the future		28
Atlantic sea herring -- Determine the extent of bycatch in the fishery and its impact on the use of TACs in managing the fishery		28

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
American brook lamprey, Bluebreast darter, Bridle shiner, Eastern sand darter, Iowa darter, Mud sunfish, Round whitefish, Sharpnose darter – Conduct surveys to determine distribution and abundance throughout its range; conduct synoptic surveys every 10 years in each drainage system where this species occurs; research larval ecology		16
American brook lamprey, Eastern sand darter – Evaluate re-establishing populations in suitable historic habitat		16
Atlantic sturgeon – Conduct surveys to assess the status of adult stock; collect tissue for stock identification		16
Atlantic sturgeon – Investigate the feasibility of hatchery culture and stocking to aid recovery		16
Atlantic sturgeon – Study life history and population status; identify foraging sites		16
Atlantic sturgeon – Encourage a moratorium on sturgeon landings from coastal fisheries		16
Atlantic sturgeon. Determine factors responsible for seasonal abundance of sturgeon at the discrete deepwater site off Clinton; investigate benthic prey resources, prey ingested and habitat mapping; determine stock identification, age and sex ratio of this group of fish		27
Examine Atlantic Sturgeon prey availability, food habits, distribution, movements and habitat use in Long Island Sound using GIS to overlay existing trawl survey distribution, sediment substrate and bathymetry data with data to be collected on prey availability (bottom grabs), food habits (gastric lavage), and movements (radio or acoustic telemetry, data logging, archival tagging)		27
Banded sunfish – Conduct focused surveys of distribution, abundance, and age-classes, concentrating on swampy, weedy areas and historical sites	7	16
Banded sunfish, Deepwater sculpin, Eastern sand darter, Gravel chub, Gilt darter, Northern brook lamprey, Sharpnose darter, Silver chub, Spotted darter– Develop long-term monitoring programs to establish population trends and monitor habitat quality changes	7	16
Banded sunfish, Bluebreast darter, Candy darter, Channel darter, Deepwater sculpin, Gilt darter, Lake sturgeon, Longhead darter, Mountain brook lamprey, Mud sunfish, Northern brook lamprey, Ohio lamprey, Silver chub, Silver lamprey, Tippecanoe darter – Determine life history information on spawning sites, larval ecology, and the effects of limiting factors on the early life stages; determine winter habitat information		16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Banded sunfish, Eastern sand darter, Lake sturgeon, Northern brook lamprey, Silver lamprey – Develop a statutory basis for withdrawing water in unprotected watersheds, including a review of all urban development proposals which affect projected water withdrawal from lakes, rivers, streams, and wells on fish and other aquatic populations	8	16
Banded sunfish, Eastern sand darter, Lake sturgeon, Silver lamprey – Determine safe water yield levels in aquatic systems that support this and other species of conservation concern; include water budgets, inputs, and outputs	8	16
Banded sunfish – Address impacts on the species' habitat outside of its core range; incorporate protection in wetlands legislation and land-use planning	1, 2	16
Blackbanded sunfish – Determine distribution and abundance and the identification of the historic range throughout the region		16
Blackbanded sunfish – Direct management toward clearing the issues surrounding the reintroduction of this fish into suitable habitat		16
Blackbanded sunfish – Develop regulations to prevent the illegal take and sale in the pet trade	19	16
Blackbanded sunfish – Establish pesticide and herbicide-free zones around impoundments and their outlets	9	16
Bluebreast darter, Bridle shiner, Channel darter, Iowa darter, Northern brook lamprey, Round whitefish, Silver chub – Determine abundance, distribution, and population trends; conduct microhabitat surveys		16
Bluebreast darter, Round whitefish – Evaluate propagation efforts to augment populations		16
Bluebreast darter, Candy darter, Channel darter, Gilt darter, Longhead darter, Sharpnose darter, Spotted darter, Tippecanoe darter – Aggressively enforce timber/mining BMPs and current mining regulations to protect water quality	9, 16	16
Bridle shiner, Iowa darter – Study the habitat requirements for reproduction and growth		16
Candy darter, Gilt darter, Sharpnose darter – Evaluate species' status and adopt adequate legal protection for maintaining secure and sustainable populations		16
Candy darter – Prevent habitat modification; adopt and aggressively enforce regulations to control chemical and thermal discharges	1, 2, 9	16
Candy darter – Determine risk of predation by introduced exotics, such as brown trout	3, 4	16
Channel darter, Eastern sand darter, Gilt darter – Improve water quality by reducing siltation loads; protect species through watershed management	9	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Channel darter -- Determine the reasons for population declines, with efforts made to determine if reproductive ecology is a limiting factor		16
Deepwater sculpin – Study habitat requirements and ecology, the impact of introduced species on population abundance	4	16
Eastern sand darter – Implement life history studies to determine the food sources, prey, predators, and reproductive ecology		16
Eastern sand darter, Sharpnose darter, Tidewater mucket – Determine habitat and microhabitat requirements suitable for reproduction and self-sustaining populations		16
Eastern sand darter, River redhorse – Control of point and nonpoint pollution sources, especially agricultural runoff; replant open stream banks and levees; fence livestock from streams	9, 15	16
Gravel chub, Lake chubsucker, Mountain brook lamprey, Round whitefish, Spotted darter – Determine distribution and abundance, life history and ecology, reasons for population declines		16
Gravel chub, Gilt darter, Lake chubsucker, Mountain brook lamprey, Ohio lamprey, River redhorse, Sharpnose darter, Silver lamprey, Spotted darter, Tippecanoe darter – Encourage and enforce agricultural and timbering BMPs; control runoff containing herbicides, pesticides, fertilizers, and silt; promote the fencing of livestock from streambeds (consider solar wells instead) and the maintenance of riparian buffers through incentive and stewardship programs	6, 8, 9, 15, 16	16
Gravel chub, Gilt darter, Mountain brook lamprey, Ohio lamprey, River redhorse, Sharpnose darter, Silver lamprey, Spotted darter, Tippecanoe darter – Research the effects of roadway runoff from bridges and along rivers; target water sampling during rain events; reduce urban runoff; collaborate with municipalities and highway officials to determine the appropriate locations of planned roads and incorporate catch basins and stormwater drainage systems	9	16
Gilt darter -- Work with sister regulatory agencies to ensure that industrial, municipal, and agricultural facilities make a continuing effort to reduce stream-contaminating effluents and prevent catastrophic pollution events	9	16
Iowa darter – Develop sampling techniques with the least impact on populations		16
Lake chubsucker – Conduct monitoring studies to assess population dynamics, trends, status, fish assemblage, and habitat quality changes over time; study habitat and pH requirements, the effects of siltation on populations	1, 8, 9	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Lake sturgeon -- Conduct baseline population surveys; use radiotagging to provide information on life history, preferred habitats, and movement patterns; monitor changes in habitat quality, population levels, harvest quotas, and reproduction; investigate growth, mortality, movements, food intake, and factors affecting year class strength		16
Lake sturgeon, Northern brook lamprey, Sharpnose darter, Silver lamprey, Tidewater mucket -- Enforce run-of-river regulations through regular monitoring of gauges where hydroelectric dams exist; develop long-term management agreements with major landowners and hydropower suppliers to protect aquatic populations sensitive to water level changes	8	16
Lake sturgeon – Evaluate dam removal to restore spawning habitat and historic spawning migration	8	16
Lake sturgeon – Incorporate a strict control over harvest quotas, the rehabilitation of spawning stock, pollution control, and habitat restoration in management plans; include genetic evaluation in any hatchery stocking; restrict the fishery throughout its range until the species has recovered	7, 14	16
Longhead darter -- Conduct population and metapopulation dynamics studies, including information on movement and dispersal patterns; verify rangewide distribution and abundance; conduct regular monitoring of separate populations to determine the possibility of cyclic population fluctuations and to map population trends		16
Longhead darter – Protect habitat from stream channelization and the removal of woody debris from stream margins; evaluate stream restoration where this has occurred	1, 2	16
Mud sunfish – Increase sampling to define abundance and distribution, with efforts specific to its nocturnal and secretive habits; develop information on the absence of the fish in what appears to be suitable habitat; determine the causes of its decline	7	16
Northern brook lamprey – Develop techniques to accurately identify this species		16
Ohio lamprey – Devote resources to intensive surveys to determine population distribution and abundance to establish population trends; document new occurrences throughout its range; determine migratory nature and movement patterns	7	16
River redhorse – Use shocker boats and personnel trained in the correct identification of the fish to complete abundance and distribution data	7	16
River redhorse – Protect spawning sites	5	16

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Sharpnose darter – Study reproductive ecology, with emphasis on a more complete understanding of fish hosts; determine distributional and abundance information, including time-search information, catch rate, animals/hour, and age/size distributions; conduct demographic studies where healthy populations of the species exist; identify parameters of a self-sustaining population	7	16
Sharpnose darter – Develop effective and reliable techniques to treat acid mine drainage; assess the effects of SONAR (to control water milfoil) and other chemical treatments of ponds and lakes	3, 9	16
Sharpnose darter – Develop multi-state BMPs should also be developed for DOT bridge crossings, dam operations, and shoreline development, including guidelines for buildings, yards, docks/piers, and shoreline stabilization and alteration	1, 8, 9	16
Silver lamprey – Evaluate reintroduction into suitable historic habitat following the reduction in use of lampricides	7, 9	16
Spoonhead sculpin, Spotted gar – Continue abundance and distribution surveys	7	16
Spotted darter – Protect riffle-pool habitat where this species is known to occur	1	

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Establish long-term monitoring programs designed to provide baseline status information for accurate and irrefutable assessment of future changes in fish populations and aquatic habitats		5, 7
Identify limiting factors in the abundance, distribution and health living marine resources including fish, birds, invertebrates, reptiles, marine mammals and marine plants		27
Monitor marine fish and invertebrate species abundance, distribution, community and size composition over time and in relation to major habitats to evaluate the effectiveness of fisheries, habitat and water quality management		27
Develop and maintain a geographic information system (GIS) database of marine habitats and living resources	1	27
Evaluate the effect of fishing effort restrictions on non-target species considering reductions in bycatch of non-target species, changes in predator-prey dynamics, habitat responses (bottom disturbance, including SAV), changes in food (bait) and structure (trap) availability	13, 14	27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Develop an acoustical survey capability to assess schooling fish populations including Atlantic menhaden, alewives, and Atlantic herring		27
Evaluate the effect of aquaculture activities on wild fish, invertebrate, bird, reptile and marine mammal resources considering placement of cultch, cages, pens and similar structures as well as mechanical disturbance from hydraulic dredging	14	27
Conduct comprehensive ichthyoplankton studies of Connecticut waters		27
Integrate ocean resource policies and management regimes, managing fish, habitats, and pollution of the coastal ocean more compatibly with consideration of land-based activities (urban and agricultural)	18, 19, 20, 21	6, 7
Integrate water use, water quality, and land use data in river management decisions	8, 9, 21	20
Incorporate sea level rise in planning efforts to protect threatened manmade and natural resources; consider the projected rise in sea level in location, design, and protection of development to ensure continued usefulness of properties and utilities and to avoid unnecessary future costs	8	20
Use mapping technology and satellite imagery at the metropolitan level to inventory the undeveloped watersheds in each; use results to guide development patterns via zoning codes, infrastructure planning, and land-protection programs; assign growth to the developed watersheds first	1, 2, 9, 20, 21	9
Ensure that local governments zone to provide adequate land for future development within developed or developing watersheds	1, 2, 9, 20, 21	9
Encourage housing densities in undeveloped (agricultural) areas lower than one unit per 20 acres	1, 2, 9, 20, 21	9
Require that all infrastructure spending (e.g., NFIP, highway funds, USDA and EPA water and sewer line funds) be consistent with regional growth plans	1, 2, 9, 20, 21	9
Utilize coordinated efforts between land trusts and federal, state, and local governments to protect large watersheds	1, 2, 9, 20, 21	9
Strengthen regulations regarding the location and operation of confined animal feeding operations	9, 15	9
Reverse the trend of declining housing densities through a concerted effort to rebuild cities and eliminate exclusionary large-lot zoning in the suburbs; increase public support by using examples of real communities with higher housing densities that are widely acknowledged as desirable	1, 2, 9, 19, 20, 21	9
Limit nitrogen pollution by reducing or eliminating cul-de-sacs and disconnected street designs; connect the street network by requiring subdivision road systems to link with adjacent subdivisions	9, 20, 21	9

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Simplify zoning codes to discourage trips taken in vehicles and encourage pedestrian trips; integrate houses with stores, civic buildings, neighborhood recreational facilities, and other daily or weekly destinations	9, 20, 21	9
Allow and encourage traditional development patterns to minimize the extent of impervious surfaces and reducing the amount of airborne nitrogen; minimum density for new development should be 7 - 10 net units per acre; require block densities (e.g., more than 100 blocks/mile) that support walking and reduce the length of vehicle trips	9, 20, 21	9
Encourage municipalities to prepare and implement state-approved open space plans to preserve and protect key wetlands and migration corridors that contribute to environmental conditions of EFH	1, 6, 8, 9	11, 23
Support state, local and interstate efforts to protect and restore vital coastal habitats and resources, such as salt marshes, beaches and coves	1, 2, 5, 8, 9	20
Establish buffers and setbacks that are appropriate for the area to be developed—more extensive in undeveloped watersheds than in developed watersheds	9, 20, 21	9
In development projects, seek to avoid significant impacts to essential fish and wildlife habitats and migration corridors	20, 21	20
Encourage municipalities to adopt and implement river protection districts to protect riverine EFH	1, 6, 8, 9	11
Promote conservation at the watershed scale, which requires cooperation and communication among multiple agencies with varying jurisdictions	21	19, 23
Use the precautionary, adaptive management approach to management that acknowledges the inherent variation and unpredictability in marine ecosystems; support scientific integration and applied predictions in adaptive management; incorporate science as a key role in marine ecosystem management		1, 2, 4, 6, 7, 8
Incorporate broad monitoring programs that directly involve fishers; ecosystem models that describe the trophic interactions and evaluate the ecosystem effects of fishing; and field-scale adaptive management experiments that evaluate the benefits and pitfalls of particular policy measures into ecosystem-based management programs		7
Restructure the regulatory milieu to include marine zoning designed to reduce management error and cost, provide sites for evaluating the effects of fishing, and provide substantive support for law enforcement by developing enforceable regulations, require the use of vessel monitoring systems, and require permitting and licensing for all fisheries	7, 11, 12, 13, 14, 17, 21	7

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Acquire information on predator-prey and competitive interactions to better understand the impact of fishing on natural systems (invest in basic ecological study and monitoring and change perspective from a single-species approach in which maximum sustainable yield is a goal, to acknowledging that fishery production is entirely dependent on functioning ecosystems)	4, 7, 14, 17	7
Reduce fishing mortality by using more accurate stock size assessments and decreasing political interference in reducing catches	7, 19	7
Modify fishery management’s institutional structure to be less affected by political expediency	7, 19	7
Establish broad monitoring programs that involve fishers and require quantitative information on targeted catch and all forms of bycatch	13	7, 8
Shift the burden of proof from managers to fishers, including the burden of demonstrating the effects of fishing mortality rates on target species and bycatch; demonstrating the effects of fishing on habitat; and assuming the liability for the costs associated with fishing-induced habitat restoration	1, 7, 13, 14, 19	7
Require all proposals to develop marine protected areas be accompanied by requirements that all commercial and for-hire recreational fishing vessels operating in the affected area be required to use a vessel monitoring system to aid in enforcement	14, 17, 19	7
Require all participants in fisheries be subject to permitting, both a general fishing permit and fishery-specific permits; require all boat owners, captains, and crew obtain a license to fish; amend laws to require the forfeiture of fishing permits for certain violations, including habitat destruction and repeated fishery violations	1, 6, 13, 14, 17, 19, 21	7
Establish water quality standards for nutrients in rivers, lakes, estuaries, and coastal waters; establish ambient water quality standards for nitrogen, and on a watershed-by-watershed basis identify additional nutrients and toxic pollutants for which water quality standards are needed	9, 12	8
Require watershed-based water quality compliance planning	8, 9	8
Provide a complementary suite of incentives for improving water quality and disincentives for activities that harm water quality	9	8
Encourage municipalities and counties to change their zoning and subdivision codes to promote compact growth near urban centers, to discourage growth outside town centers in rural areas, and to reduce impervious surface cover wherever possible	8, 9, 20, 21	8

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Require local growth-management planning as a condition for receipt of state and pass-through federal development assistance, and ensure that state and local growth and transportation planning comport with statewide habitat protection plans	20, 21	8
Coordinate policies and practices among local jurisdictions and, to the extent possible, with adjacent states to ensure a rational regional approach to growth management	20, 21	8
Fund development of biological nutrient removal technology standards to reduce nitrogen loads from publicly owned treatment works and for municipalities to install biological nutrient removal treatment in watersheds where such loads are a significant source of water quality impairment	9	8
Develop an inventory of existing species and their historical abundance for each regional marine ecosystem		8
Evaluate requiring the utilization of best available sound control technologies, where the generation of sound has potential adverse effects	9	8
Support the study of the effects of toxic substances in the marine environment	9, 10	8
Implement a large-scale public education campaign on the effects of coastal development on aquatic ecosystems, targeting local officials, state and federal regulatory agencies and representatives, and the public	19, 20	9
Support the establishment of regional ocean ecosystem councils that would develop scientifically-based regional ocean governance plans; councils should use zoning as part of their regional governance plans	21	8
Encourage industries that play a fundamental role as vectors transporting non native species to bear more of the costs of prevention, control, and research	3, 18	10
Support the establishment of a network of marine reserves that encompass significant portions of ecosystems and multiple habitats, including both benthic and pelagic components	1, 2, 7, 13, 14, 21	8, 23
Create a clear separation between conservation and allocation decisions in the fishery- management planning process	13, 14, 19	8
Broaden the statutory definition of bycatch to include incidental mortality of all nontarget species (fish and other living marine resources), and mortality by lost or abandoned gear	13	8
Require bycatch mortality be factored into stock assessments	13	8
Evaluate individual bycatch quotas for valuable fish species (except threatened and endangered species) to manage bycatch	13	8

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Reduce fishing capacity, where necessary, with transitional buyback programs and provide other transition assistance for displaced fishermen and affected fishing communities	7, 14	8
Require that all life history stages of organisms, especially eggs and larvae, be assessed relative to thermal impacts on local spawning populations as well regional stocks when issuing discharge permits to power plants	9	11
Require a performance standard for dredging and disposal that any dredging or disposal shall not degrade EFH	1, 2, 5, 6, 8, 9	11
Implement a citizen-based fishway stewardship program to restore and maintain EFH in New England rivers and estuaries	1, 19	11
Put funding in place to ensure the proper maintenance of fishways for the protection and restoration of riverine dependent fishery resources and EFH	1, 18	11
‘Bring people to the fishery’ through the purchase of access sites, easements, zoning, litigation to build fishing piers, boat ramps and other facilities; expand and improve public access sites to rivers and Long Island Sound	17, 19	13, 20, 22, 23, 24
Identify underused fishing opportunities, locations and resources to spread fishing demand over a broad area; use fishing ethics and education to ease problems with high demand and limited access	17, 19	13
Limit recreational access by seasonal and area restrictions, bag and size limits and other regulations necessary to maintain quality angling opportunities for a growing constituency	17, 19	13
Control access to the commercial allocation to reduce harvest capacity over time to match resource productivity	14	13
‘Bring the fish to the people’ through artificial reefs, fish ladders, habitat restoration programs	17, 19	13, 22
Control fishing methods or levels of exploitation that are detrimental to the continued viability of populations of marine species	14	22
Actively participate in regional and interstate fishery management planning conducted by the New England and Mid-Atlantic Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and both the NMFS and the USFWS		22
Develop Long Island Sound-specific fishery management plans in cooperation with the State of New York for fisheries existing in Long Island Sound		22

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Coordinate in-state and offshore fishery management activities in those instances where interstate fishery management plans have not been developed and where federal Fishery Management Plans have not been developed		22
Encourage the development of shellfish management plans which promote the conservation and wise use of shellfish resources in waters under the jurisdiction of coastal towns		22
Actively participate in the Connecticut River Anadromous Fish Restoration Program and the Connecticut River Atlantic Salmon Commission		22
Assist in the enhancement of populations of bivalve shellfish in areas where populations are established, and reestablish populations through seeding projects in areas where there is evidence that populations were once abundant		22
Encourage an increase in marine and estuarine fisheries law enforcement coverage		22
Review and comment on any federal or state regulations having direct or indirect impact on marine resources		22
Provide logistic support to other Divisions, Bureaus, and Units of the Departments of Environmental Protection and Agriculture, and to other state or federal agencies, which may be involved in pollution abatement and environmental monitoring activities		22
Review all applications for permits to conduct regulated activities in LIS; upon review of any activity determined to result in an adverse impact upon marine or estuarine fishery resources, prey species, or habitat – or any other adverse impact upon the environment – recommend denial of the permit and provide justification for this recommendation to the appropriate agency		22
Obtain information on catch, effort, area fished, and port of landing from all commercial fisheries at a level of detail that will allow DEP fisheries scientists to estimate the relative condition of stocks of fishery resource species and to monitor the performance of Connecticut’s commercial fisheries		22
Investigate methods by which the landings of vessels that do not fish in Connecticut waters but land their catch at Connecticut ports can be accurately quantified		22
Obtain recreational fishery statistics for the informational needs and management activities of the Marine Fisheries Program		22
Improve the level of coordinated data transfer and information processing between existing National Marine Fisheries Service and DEP data processing systems. Improve the integration of information on commercial shellfish landings within the cooperative program		22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Conduct resource monitoring programs independent from the biases associated with commercial and recreational fisheries for the most important and most heavily exploited of the marine and estuarine species inhabiting the Sound		22
Conduct research on the biology and population dynamics of resident and migratory marine and estuarine species, and on the general ecology of Long Island Sound		22
Investigate the advantages of instituting a salt water recreational angling license similar to, and consistent with, the provisions of federal legislation initially introduced to the U.S. Congress in 1983		22
Promote further development of the Connecticut offshore fishing fleet and shore-side support facilities through comment on fisheries development proposals, and aid in the procurement of financial assistance for appropriate projects proposed by municipalities and individuals to develop fisheries facilities to serve the fleet		22
Encourage the development of efficient commercial fishing facilities in appropriate Connecticut harbors to accommodate inshore Long Island Sound fishermen by providing docking, storage space for equipment, ice-making capabilities, and fuel		22
Promote the development of in-state processing facilities to serve fishermen landing their catch in Connecticut, including filleting plants, canneries, and freezing plants for both traditional and underutilized species. Encourage the development of an in-state marketing system and promotional program for Connecticut seafood		22
Assist the State of Connecticut Aquaculture Commission in investigating the feasibility, potential for success, and legal, economic, technical, and other limitations involved in developing Connecticut's mariculture industry		22
Encourage the development of a tax and business climate that is favorable to the commercial fishing industry, similar to that provided in other New England states and to the agricultural industry in Connecticut		22
Promote the development of commercial fisheries and markets for presently underutilized species and promote the recreational utilization of these species where they are available outside of, and within, Long Island Sound		22
Alleviate conflicts among resource users		22
Promote the management of town shellfish resources to provide increased shellfishing opportunities for all citizens of the state		22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Incorporate a variety of visual technologies (geographic information systems (GIS), computer animation, satellite imagery, and digital photography), tailored for local use, in public education campaigns	19	9
Educate homeowners about their responsibility in watershed management, such as buffer and yard maintenance, proper disposal of oil and other toxic materials, and the impacts of excessive automobile use	9, 19	9
Continue education and training for appointed and elected volunteers at the municipal level who oversee wetland regulation; improve guidance to better integrate wetland protection with surrounding upland areas and from impacts of stormwater management practices	1, 2, 9, 19, 20	20
Educate local decision-makers on how to deal adequately with nonpoint sources of pollution. Focus on the reduction of impervious surfaces, reduce blacktop and sidewalks, whenever feasible	9, 19	20
Enhance the public’s understanding of resource conservation and natural diversity, and foster beneficial land use practices through educational programs and demonstration areas	19	20
Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic habitat	19	20, 23
Develop an outreach and public awareness campaign focusing on prevention of bioinvasions, educating the public about the harm they can cause	3, 19	10, 11, 19, 24
Collaborate with federal, local and non-profit entities to educate the public about the potential problems of hazardous wastes, excess nutrients and petroleum products discharged to marine, estuarine, and riverine environments that may potentially impact EFH	9, 19	11
Disseminate information on EFH, BMPs, and financing options for controlling stormwater runoff and mitigating existing problems; target state and local public works and highway departments	8, 9, 19	11
Encourage state highway department to prepare design manuals (e.g. stormwater management guides) that integrate environmental considerations and EFH mapping into all phases of highway project planning, design, construction, and maintenance; schedule annual workshops for local highway departments on the importance of reducing suspended solids entering aquatic and marine environments	8, 9, 19	11
Collaborate with federal agencies and non-profit groups to promote education programs on environmentally safe boating to recreational boaters to reduce impacts on EFH	19	11
Educate state highway departments and local departments of public works on the need to maintain or increase tidal flow through culverts such as those underneath roads and railroad corridors	8, 19	11
Continue education efforts on the hazards of marine debris to certain marine life and EFH	9, 19	11

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Educate the public and policy makers about the biodiversity hidden from view in freshwater systems and the cumulative effects of land uses on downstream waters	19	19
Educate boaters to prevent the spread of invasive species by completely draining all water from the boat, including bilge water, live wells and engine cooling systems; inspecting their boat, trailer and equipment, removing and discarding all aquatic plants and animals; rinsing the boat, trailer and equipment with tap water; and leaving live bait behind	3	14
Encourage boaters and fishermen to protect eelgrass beds by using marked navigational channels around eelgrass beds and obeying posted speed limits, avoiding navigating through eelgrass beds in shallow water where propellers can cut or uproot plants, avoiding anchoring in eelgrass beds, using holding tank pumpout facilities, avoiding feeding waterfowl, and minimizing the use of lawn fertilizers and other chemicals	1, 5, 6, 12, 19	15, 21, 23
Develop improved educational material to better enable municipalities and the public to protect Long Island Sound and coastal waters	9, 12, 19, 20	20
Promote an understanding and appreciation of LIS as a regional ecosystem and a national treasure	19	23
Through the use of initiatives such as Project WET, Project SEARCH, the Long Island Sound License Plate Program, and the LISS Small Grants Program, offer Long Island Sound field and learning experiences to as many school children as possible, with a goal of reaching 50% of the school children within the state’s portion of the watershed by 2010	19	24
Promote public participation in the marine fisheries management process by soliciting information through well-publicized public informational meetings	19	22
Increase the availability of information derived from marine fisheries research and management projects	19	22
Promote public awareness of the availability of information derived from the Marine Fisheries Information System and encourage public use of such information to increase the general knowledge of Connecticut’s marine resources and fisheries	19	22
Develop a saltwater recreational fishing guidebook for Connecticut waters	19	22
Require municipal water resource agencies to make water conservation devices available to the public; educate the public about the need to conserve water for the protection of fishery resources and EFH	8	11, 21
Conduct yearly assessments to determine if municipalities are complying with their water use permits; penalize those that exceed their allocated withdrawals with fines to use for restoring riverine anadromous fish EFH	8, 18	11

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Reduce water consumption through implementation of sustainable agriculture and restrictions on nonessential water use and reducing groundwater pumping in sensitive areas	1, 2, 8, 15	19
Complete a feasibility study for a more comprehensive coastal flood monitoring and warning system	8	20
Develop, in collaboration with DEP’s Rivers Advisory Committee, policies for water allocation and water supply watershed protection	8	20
Define a method to better identify basins where water resources are over-allocated, and address these problems using the Rivers Assessment conducted under the DEP Rivers Management Program to allocate resources and direct more site specific management recommendations	8	20
Prevent expansion of the numbers of vessels employing mobile bottom gear by restricting the numbers of licenses, permits, or endorsements to no more than current fleet sizes, allowing transfers of licenses only to gears that are documented to have lower impacts on habitats, and allowing reentry of latent mobile gear effort only with gears documented to have lower impacts on habitats	1, 2, 6, 21	8
Encourage more selective fishing gear and practices which efficiently harvest target species and sizes without negatively impacting non-target species and sizes	7, 13, 14	13
Develop and implement a policy on the use of oil spill chemical counter measures (e.g. dispersants) to protect EFH from the adverse effects of oil spills	9	11
Encourage municipalities to establish and promote the use of used motor oil collection facilities to ensure proper collection and disposal of used motor oil from the general public to mitigate the threat of oil entering the environment	9	11, 21
Form partnerships with business communities to facilitate safe management of hazardous products, emphasizing recycling and reduced use of hazardous products wherever possible, to reduce the potential threat of toxicants entering the environment	9	11
Encourage municipalities to establish household hazardous waste collection programs to ensure the proper disposal of hazardous products to reduce the potential threat of toxicants entering the environment	9	11
Encourage municipalities to adopt and implement regulations to ensure the safe use, storage, and disposal of hazardous materials for the conservation of EFH: 1) hazardous materials regulations, 2) underground storage tank regulations, and 3) commercial and industrial floor drain regulations	9	11
Identify and form a database of contaminated sediments that may pose substantial threats to fishery resources and EFH for New England coastal, estuarine, and riverine benthos	1, 9	11

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Require pretreatment and recycling from industries that produce hazardous wastes prior to wastewater treatment	9	11
Monitor (with EPA) discharge monitoring reports of NPDES permit holders and work with them to ensure that they are in compliance with their chlorine limits; prefer other methods of disinfecting wastewater, such as UV irradiation, instead of chlorine to minimize or remove any level of chlorine discharge	9	11
Evaluate eliminating the use of chlorine, at least seasonally, to reduce the amount of chlorine entering the environment (in cases where human health concerns from the consumption of contaminated shellfish or from contact with contaminated water are not issues)	9	11
Support research and development in innovative and cost-effective methods to minimize and reduce levels of chlorine discharged into EFH	9	11
Require consideration of EFH designations and use of on site stormwater BMPs as a precondition to the permitting of private property tie-ins to state drainage facilities	8, 9	11
Retrofit power plants with the best technology available to minimize plant-induced entrainment and impingement mortalities		11
Require thorough fisheries assessment, including ichthyoplankton surveys, be incorporated into all entrainment studies by power plants that withdraw water from inshore regions	8	11
Integrate watershed strategies into existing and emerging state growth management programs	9, 19, 20, 21	9
Enact legislation that provides for the designation of freshwater systems as natural protected areas, particularly for the few remaining most intact and unaltered river systems		19
Implement the Protected Rivers and Rivers Restoration programs, and the Multiple Use Rivers statute when competing uses must be balanced		20

**INVERTEBRATES: Compilation of Conservation Actions for Connecticut
from Existing Management Plans and Literature**

Source Codes:

- 1 = Vaughan (2002): Potential Impact of Road-Stream Crossings (Culverts) on the Upstream Passage of Aquatic Macroinvertebrates
- 2 = Hoffman Black and Vaughan (draft): Endangered Insects. In: The Encyclopedia of Insects
- 3 = Hoffman Black et al. (2001): Endangered Invertebrates: the case for greater attention to invertebrate conservation
- 4 = USFWS (1994): Recovery Plan for the Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis* Say)
- 5 = USFWS (1993): Recovery Plan for the Puritan tiger beetle (*Cicindela puritana* G. Horn)
- 7 = NEES&WDTC (draft): Eastern pond mussel (*Ligumia nasuta*)
- 11 = NEES&WDTC (draft): Salamander mussel (*Simpsonaias ambigua*)
- 13 = NEES&WDTC (draft): Yellow lamp mussel (*Lampsilis cariosa*)
- 14 = NEES&WDTC (draft): Brook floater (*Alasmidonta varicosa*)
- 17 = Odonate Conservation Actions from M. Thomas (Jan. 2004) Personal Communication
- 18 = Invertebrate Conservation – notes from L. Rogers-Castro, Personal Communication
- 19 = The Nature Conservancy (comment letter of October 27, 2003)
- 20 = TNC (2003): Lower New England – Northern Piedmont Ecoregional Conservation Plan
- 21 = CT OPM (1998): Conservation and Development Policies Plan for Connecticut, 1998-2003
- 22 = CT DEP Staff - CWCS Planning Process Input/Survey Response
- 23 = Pew Oceans Commission: Dayton et al. (2002) Ecological Effects of Fishing
- 24 = TNC (1999): North Atlantic Coast Ecoregional Conservation Plan
- 25 = CT DEP Staff - CWCS Planning Process Input/Survey Response

Threat Addressed by Conservation Action Codes:

- 1 = Habitat Loss and/or Degradation (e.g. forest fragmentation, development, overabundant deer, towed bottom-tending fishing gear, marine construction projects, etc.)
- 2 = Habitat Conversion (succession, agricultural, fire exclusion, etc.)
- 3 = Invasive/exotic species
- 4 = Introduced or over abundant Predators/nest parasites
- 5 = Limited Distribution (barrier islands, calcareous fens, etc.)
- 6 = Disturbance to birds and other wildlife (during breeding, etc.)

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

- 7 = Population imbalance or decline (state, regional, global ranks)
- 8 = Hydrologic changes (water diversion, discharge, groundwater extraction, impeded tidal flow, climate change)
- 9 = Pollution (water quality, pesticides, endocrine disruptors, nutrient enrichment, air quality, light, sound, oil spills, etc.)
- 10 = Disease (West Nile Virus, public health, etc.)
- 11 = Collision hazards
- 12 = Seasonal hypoxia/anoxia in Long Island Sound and Estuaries (harmful algal blooms, eutrophication)
- 13 = Bycatch
- 14 = Overfishing and Aquaculture Impacts
- 15 = Farming practices (land intensive, increased use, etc)
- 16 = Forestry practices (unregulated, etc.)
- 17 = Recreational Demands
- 18 = Limited or unstable Funding, Resources and Staff
- 19 = Lack of Appropriate Citizen and Political Support (diminished sportsman user group, animal rights, misinformed/uninformed public, hiring/policy, competing priorities, lack of regulations, decision-making without appropriate information, private property rights, etc.)
- 20 = Unplanned urban development and growth (inability to control or influence private land development under local jurisdiction, lack of information to municipalities, lack of landowner incentives, population growth, changing economy, etc.)
- 21 = Lack of Cumulative Impact Analysis and Regional Landscape Planning

Habitat-Focused Conservation Action	Threat Addressed	Source
To minimize the impact of culverts on upstream dispersal, as well as their overall effect on the hydro-geomorphology of a stream: culverts should be as wide as possible to allow for lateral movement of the stream (in fact, if possible, bridges should be built instead); and the bottom of culverts should be set at least 20 cm below the surface of a stream's substrate.	1, 2, 8	1
Although culverts may impede the upstream dispersal of some native macroinvertebrate species, these same barriers also may help slow or prevent the spread of noxious invasive species. However, the degree to which culverts will impede their dispersal remains unknown and experts agree that, to block the movement of an invasive species, barriers need to be designed especially for this purpose.	1, 2, 8	1

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Assess what endangered or invasive species are located in a watershed and how they might be affected by a culvert design and placement on a case-by-case basis. In most cases, making sure all organisms can pass through a culvert is the best policy, but it is advised that surveys of aquatic organisms be made to predict how culverts affect these species, and the management goals for that stream.	1, 2, 8	1
Culverts should be designed to allow upstream movement of almost all macroinvertebrates, including those inhabiting the rocks, gravel, and sand that make up the streambed. Culverts should be built as wide as possible in order to reduce the negative impacts of increased stream velocity on upstream passage, as well as the effects of the erosion and sedimentation caused by channelization. In addition, culverts should be designed so that twenty years from now, erosion hasn't cut away the substrate at the downstream end, leaving the outflow hanging above the downstream water level.	1, 2, 8	1
Catalog and study the large and growing number of endangered insects. The rate of destruction and degradation of natural habitats currently is so great that there are not nearly enough biologists to even catalog, much less study, the species that are suddenly on the edge of extinction.	1, 2, 18	2
Protect habitat for non-charismatic taxa and move forward with community-wide studies as a practical way to gather information about the diversity and distribution of little known taxa.	1, 7, 18	3
Large swaths of land designated as wilderness, protected for wide ranging species, or set-aside in conservation easements will ultimately benefit invertebrates. Some invertebrates only need small areas to thrive, and indeed backyard gardens can help some pollinators.	1	3
Protect habitat for marine invertebrate species. We need marine reserves managed for these species, not marine reserves where commercial fishing and other destructive activities are allowed, as is often the case now.	1	3
Conduct surveys on coastal plain ponds lacking or having few survey data	1, 7, 18	17
Monitor odonate populations of both listed and non-listed species	1, 7	17
Create (manmade) coastal plain pond habitat	1, 2, 8	17
Conduct surveys in sphagnum wetlands to monitor and determine size of existing populations (exuviae counts) in all sphagnum wetlands – Atlantic White Cedar and acidic sphagnum bogs/fens.	1, 7, 18	17
Increase survey and monitoring of seepages and forested streams for existing odonate habitat and populations	1, 7, 18	17
Prevent dumping into Danbury wetland	9	17
Minimize recreational impact to sandy beaches along Connecticut River and degradation to water quality; monitor populations.	17	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Conduct surveys and monitor odonate populations in rivers and streams with fast current (riffle and rapids)	1, 7	17
Develop relationship with Hollenbeck Fishing Club to minimize potential impact of agricultural practices along Hollenbeck river	15, 17, 19	17
Conduct surveys and monitor odonate populations in coldwater streams	1, 7	17
Blackwater Streams/Rivers Habitat has not been surveyed; potential habitat for several species of odonates not documented from Connecticut but occurring in RI (e.g. <i>Enallagma weewa</i> , <i>Somatochlora georgiana</i>)	1, 7	17
Preserve adult feeding and maturation habitat for threatened and endangered dragonflies and damselflies; requirements poorly known and often species specific.	1, 7	17
Invertebrate conservation should be a strong component of a comprehensive wildlife management plan. Invertebrates are often overlooked by agencies, scientists, conservationists and land managers even though they are incredibly important in functioning ecosystems (part of almost every food chain, recycle nutrients, decompose 99% of human and animal waste, act as pollinators, serve as keystone species, etc.)	1, 7, 18, 19	18
Herbicides for roadside spraying and in forestry practices should be minimized to lessen impact on butterfly habitats; minimize or eliminate pesticide use	1, 9, 15, 16	18
Bogs and calcareous wetlands in the northwest highlands are important dragonfly/damselfly conservation areas	1	
Work to counteract the fact that recovery plans are biased toward vertebrates and to balance the contrast between expenditures for invertebrates when compared to vertebrates.	18, 19	3
Work collaboratively with TNC to maintain a healthy forested ecosystem; identify and manage portions of state land for biological diversity and old growth characteristics; conduct some forestry in parts of the state forest to accelerate old growth characteristic and legacy features.	1, 21	19
Work collaboratively with TNC for joint burning in areas to control invasives, restore butterfly habitat and facilitate oak regeneration.	1, 3, 21	19
Continue to implement and monitor the phragmites control projects at Lord Cove and Lieutenant River, working with partners on identifying and implementing an overall phragmites control and periodic maintenance strategy for the Lower Connecticut River as a whole. Control other invasive species such as Japanese barberry (forest) or Purple loosestrife through inventory work and developing strategies to control the most problematic areas.	1, 3, 21	19

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Work collaboratively with TNC on large-scale conservation efforts to address <i>in-stream flow regulation</i> : Gain a better understanding of the relationship of human use of water, natural flow regimes, and aquatic biodiversity would help determine what sort of actions need to be taken.	1, 8, 21	19
Control invasive species in tidal marshes (e.g., phragmites)	3	19
Collaborate with The Nature Conservancy to better define the threats resulting from atmospheric deposition and determine what should be done to abate them	9	19
Review progress towards goals for karner blue butterfly once standard sites have been lumped into functional metapopulation sites in BCD by state Heritage Programs.	9, 21	20
Conserve multiple viable occurrences of all aquatic community types and restore hydrologic processes to promote healthy, functioning aquatic ecosystems.	1, 8	20
Ensure the continued existence of the eleven matrix forest communities (in the Lower New England - Northern Piedmont ecoregion) and restore natural processes to promote development of mixed-aged stands	1, 2	20
Conserve multiple viable occurrences of all aquatic community types and restore hydrologic processes to promote healthy, functioning aquatic ecosystems	1, 2, 8, 9	20
Restore tidal flows to coves, embayments, tidal rivers, and tidal wetlands when flow control structures, such as culverts, tidal gates, and bridges need to be replaced in order to improve degraded habitat, water quality, or control of the spread of disease-threatening mosquitoes	8, 9, 10	21
Monitor the condition of prime shellfish production areas.	1, 7, 14	21
Monitor current mitigation projects to determine whether wetland functions are being properly replaced; improve mitigation planning accordingly; define buffer areas adequate to protect wetlands and associated resources	1, 2, 8, 9, 20	21
Work toward elimination of shellfish closure areas by upgrading water pollution control facilities and reducing non-point sources of pollution.	9, 14	21
Continue participation in the Long Island Sound Study and promote the implementation of its recommendations in the following areas meriting special attention: low dissolved oxygen (hypoxia); toxic contamination; pathogen contamination; floatable debris; the health of living marine resources; public involvement and education; habitat loss and water quality degradation from land use and development.	12	21

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Maintain existing high quality waters and restore and manage the waters of the state to a quality and quantity consistent with their use for water supply, water-based recreation, and for the protection and propagation of fish, shellfish, and wildlife. To protect the public health and welfare and promote economic development and agriculture.	9, 12, 14	21
Determine the ecological conditions and health of the 105 significant recreational lakes in Connecticut. Promote and provide technical support for lakes management studies to evaluate biological, chemical, and physical water quality problems as well as problems of accelerated lake eutrophication. When feasible, support state and local efforts to restore lakes and ponds.	1, 9	21
Contain and eliminate the polychlorinated biphenyl problem throughout the state and specifically in the Housatonic River by the examination of biological life, analysis of sediment transport, consideration of bottom removal, and possible bioremediation. Continue cooperative efforts with the state of Massachusetts and pursue efforts with the U.S. Environmental Protection Agency to implement these cleanup efforts.	9	21
Manage the major environmental problems of Long Island Sound through the Comprehensive Conservation and Management Plan of the Long Island Sound Study. Utilize that Plan to address the predominant problems of hypoxia (low dissolved oxygen), toxic contamination, pathogens, floatable debris, and the health of the Sound's finfish and shellfish.	9, 12	21
Identify and protect critical environmental areas of the state.	1, 18	21
Continue DEP's comprehensive inventory and monitoring program of the state's natural resources. Maintain up-to-date tools to analyze the health of natural resources systems and stresses on them and to enable easy sharing of this information. Encourage interagency and cooperative efforts, such as the Connecticut Resource Protection Project, to identify and develop information about the most critical of these resources and to devise innovative tools for their protection. Promote resource-based decisions in state and municipal planning and joint resource planning efforts across municipalities and all levels of government.	1, 18, 19, 21	21
Protect and restore remaining natural wetlands	1	21
Inventory and assess the distribution and habitat quality of rocky reef, kelp, sponge, shell, sand wave and eelgrass habitat in Long Island Sound and adjacent estuaries.	1, 7	22
Develop and maintain a geographic information system (GIS) database of marine habitats and living resources.	1, 18, 19	22
Identify limiting factors in the abundance, distribution and health of marine invertebrates	1, 7	22
Monitor marine invertebrate species abundance, distribution, community and size composition over time and in relation to major habitats to evaluate the effectiveness of habitat and water quality management	1, 7	22

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Habitat-Focused Conservation Action	Threat Addressed	Source
Preserve 10 coastal plain pond habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 coastal pine barren habitats of 1,000-3,000 acres each in eco-subregion	1	24
Preserve 10 maritime grassland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 5 maritime dune/bluff habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 brackish tidal wetland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 4 fresh tidal wetland habitats of 10-100 acres each in eco-subregion	1	24
Preserve 5 saline tidal wetland habitats of 100-500 acres each in eco-subregion	1	24
Continue to seek public and private capital for land acquisition	1, 20	24
Evaluate the effect of aquaculture activities on marine invertebrate resources considering placement of cultch, cages, pens and similar structures as well as mechanical disturbance from hydraulic dredging.	14	25

Species-Focused Conservation Action	Threat Addressed	Source
Invertebrate species - The first step to invertebrate protection is to put invertebrates on the same footing as other species in management decisions.	18, 19	3
Pollinators - Increasing attention to invertebrate systematics, monitoring, and reintroduction as part of habitat management and restoration plans; Assessing effects of pesticides, herbicides, and habitat fragmentation on wild pollinator populations; Including seed monitoring, and fruit set and floral visitation rates in endangered plant management and recovery plans; Including habitat needs for vital pollinators in the critical habitat designations for endangered plants; Identifying and protecting floral reserves near roost sites along migration corridors of threatened migratory pollinators.	1, 7, 9	3
Pollinators - increased education and training to ensure that both the general public and resource managers understand the importance of pollinators; Increase the awareness of pollinators' important role in ecosystems and of the threats they face among the public; Engage people of all backgrounds in pollinator conservation, providing them with the knowledge and confidence to take action to protect pollinator diversity and habitat; Influence decision-makers and policy through an advocacy and education campaign.”	1, 7, 19	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Bee species - Protect this dominant group of pollinators, from same threats as most other wildlife, especially loss of habitat to development and agriculture. Bees are susceptible to fragmentation of habitat, resource competition from non-native species, and use of pesticides	1, 7	3
Bee species - Consideration should be made to include the conservation of native bees in comprehensive wildlife management plans although none currently exist on the endangered, threatened and special concern species list	1, 7, 18, 21	18
Bee species – management efforts to enhance native plantings would positively impact native bees	1, 7	18
Bee species – snags left in the landscape and occasional areas of bare soil provide nesting sites for native bees	1, 7	18
Bee species – insecticides that can impact bees should not be used; continue to discourage the use of chemical insecticides to combat mosquitoes	1, 7, 9	18
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Given the lack of other alternatives for restoring the northeastern beach tiger beetle along the Atlantic Coast, reintroduction of beetles from the Martha's Vineyard population into suitable, historical habitat along the Atlantic Coast is worthy of strong consideration, as long as donor population levels are adequate.	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Recovery for the northeastern beach tiger beetle will depend to a large extent on re establishing the species across its former range along the Atlantic Coast and protecting it within the Chesapeake Bay region. The best approach for achieving this is through landscape scale conservation.	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Monitor existing populations of adult beetles and larvae. Determine population and habitat viability, analyze population viability, and model effects of habitat changes.	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Identify and protect viable populations and their habitat, including sites as identified in GRAs 1, 2, and 3 [MA, RI, CT, Long Island]	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Pursue long-term protection of priority sites: Initiate landowner contacts for all known populations; Use existing laws and regulations to protect the beetles and their habitat.	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Study life history parameters: Determine limiting factors; Determine dispersal distance and sex ratio; Complete taxonomic studies.	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis Say</i>) - Evaluate human impacts: Complete human impact studies; Study effects of shoreline alteration.	1, 7, 17	4

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis</i> Say) - Implement appropriate management measures at natural population sites	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis</i> Say) - As appropriate, reintroduce populations to sites within <i>C. d dorsalis</i> ' historical range: Determine, obtain access to, and prepare appropriate reintroduction sites; Design and test reintroduction protocol; Conduct reintroductions on an operational basis	1, 7	4
Northeastern Beach Tiger Beetle (<i>Cicindela dorsalis dorsalis</i> Say) - Implement educational activities for landowners and the public at large	1, 7, 19	4
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Discovery of the Cromwell, Connecticut site was a result of recent search efforts. Further, because of the cleanup of the Connecticut River during the past several decades, some New England sites may now be suitable for reintroductions.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Habitat protection will be accomplished through public education, acquisitions, easements, and working with landowners and local planning authorities to initiate and implement regulations for habitat conservation.	1, 7, 19	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Habitat protection is vital along the Connecticut River, and some vegetation management may be required to maintain open habitat at the extant Connecticut and Massachusetts sites.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Establishment of additional Connecticut River populations will be required for full recovery; results of recent morphological and captive rearing studies give reason for optimism regarding the potential success of this recovery strategy.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Monitor known populations: Monitor adults; Monitor larvae; Search for additional populations.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Determine population and habitat viability: Analyze population viability; Model effects of habitat changes.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Identify and protect viable populations and their habitat: Identify and pursue long-term protection of priority sites; Pursue landowner contacts for all known populations; Use existing laws and regulations to protect the beetle populations; Identify additional protection needs.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Implement appropriate management measures at natural population sites.	1, 7	5

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Study anthropogenic influences: Study the effects of recreational use on beetle habitat and survival; Examine possibilities for shoreline erosion control in	1, 7, 17	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Study life history parameters and taxonomic relationships: Determine natural limiting factors; Examine limiting factors specific to Connecticut River sites; Determine the importance of dispersal; Conduct morphometric and breeding behavior studies; Analyze genetic variability.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Develop techniques for and reintroduce populations to appropriate habitat along the Connecticut River: Develop techniques for captive rearing; Identify, acquire access to, and prepare appropriate reintroduction sites; Design and test reintroduction protocol; Conduct reintroductions and monitor results.	1, 7	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Conduct a public education program	1, 7, 19	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - Coordinate implementation of the recovery program	1, 7, 21	5
Puritan tiger beetle (<i>Cicindela puritana</i> G. Horn) - the Connecticut River Valley, including the sandy beach and sand bar communities, is an area of conservation concern for this uncommon dragonfly	1, 7	18
Tiger beetle sp. - Control invasive plants at Salmon River tiger beetle site.	1, 3, 7	19
Eastern pond mussel (<i>Ligumia nasuta</i>) - Research to determine the reproductive ecology of this species, including the identification of fish hosts, is needed.	1, 7	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Surveys should be undertaken to establish distribution and abundance, including time-search information, catch rate, animals/hour, and age/size distributions.	1, 7	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Permanent network monitoring programs need to be established to chart trends in populations and to maintain and monitor water quality.	1, 7, 18	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - In addition, data on in-stream flow requirements for this species are needed.	1, 7	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Water conservation planning should be a high priority for managers. A statutory basis for withdrawing water should be developed in unprotected watersheds, including a review of all urban development proposals to determine the effects of projected water withdrawal from lakes, rivers, streams, and wells on aquatic populations	1, 7, 8	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Research should be directed to determine safe water yield levels in aquatic systems that support mussel species and other aquatic and terrestrial species of conservation concern. This information should include water budgets, inputs, and outputs.	1, 7, 8	7

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Eastern pond mussel (<i>Ligumia nasuta</i>) - Information also is needed on the movement and response of this species to water withdrawal.	1, 7	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Efforts should be made to address the impacts on this species' habitat outside of its core range, and incorporate protection in wetlands legislation and land-use planning.	21	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Multi-state agricultural and timbering BMPs should be encouraged, and enforced where mandatory, in an effort to control runoff containing herbicides, pesticides, fertilizers, and silt.	15, 16, 21	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Information is needed on the effects of sedimentation on reproduction and recruitment. Efforts should be made to promote the fencing of livestock from streambeds and the maintenance of riparian buffers through incentive and stewardship programs. Solar wells should be considered as an alternative to watering livestock in rivers.	1, 7	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Research is needed on the effects of roadway runoff from bridges and along rivers on mussels and other aquatic species. Studies should target water sampling during rain events. Efforts should be made to reduce urban runoff by coordinating with localities and state Transportation Departments to determine appropriate locations of planned roads. Recommendations of appropriate catch basins and stormwater drainage systems should be made as part of this process in order to reduce stream pollution and the direct mortality of mussels, fish, reptiles, and amphibians.	9	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Regional guidelines should be developed and published to help states incorporate these recovery strategies into their management plans.	21	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - Mitigation guidelines would be helpful, and the effectiveness of mitigation measures should be assessed.	1, 7, 21	7
Eastern pond mussel (<i>Ligumia nasuta</i>) - In states where populations exist without legal protection, steps should be taken to review their status and initiate protection measures.	21	7
Salamander mussel (<i>Simpsonaias ambigua</i>) - Intensive, targeted surveys need to be initiated to record the distribution and abundance of this difficult-to-locate species and establish its status, especially in New York around the Buffalo area and in West Virginia.	1, 7	11
Salamander mussel (<i>Simpsonaias ambigua</i>) - Long-term monitoring studies are needed where this species is known to exist to chart population trends and to monitor and sustain water quality.	1, 7, 18	11
Salamander mussel (<i>Simpsonaias ambigua</i>) - The in-stream flow requirements of this species need to be determined.	7, 8	11

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Salamander mussel (<i>Simpsonaias ambigua</i>) - Efforts should be made to protect the last strongholds of the species in the Monongahela River drainage and to come up with effective and reliable techniques to treat acid mine drainage.	1, 7	11
Salamander mussel (<i>Simpsonaias ambigua</i>) - In states where populations exist without legal protection, steps should be taken to review their status and initiate protection measures.	21	11
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Baseline information on population status and trends, including reproductive status, recruitment, and mortality is needed before effective management decisions can be made.	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Improved survey protocol needs to be developed and tested throughout the species' range.	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Demographic studies are needed, and where healthy populations of the species have been identified, the parameters of a self-sustaining population should be determined.	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Research should identify in-stream flow requirements, specific microhabitat needs for the species, tolerance to siltation, pollution and eutrophication, and the effects of exotic bivalves.	1, 7, 8	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Specific causes of decline are unknown and limiting factors need to be identified.	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Fish hosts also need to be identified and reproductive biology understood.	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Genetic studies are necessary to understand the possible hybridization occurring between <i>L. cariosa</i> and <i>L. cardium</i> or <i>L. ovata</i> .	1, 7	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Research also is needed on the effects of global warming on future fish host populations and their distribution.	1, 7, 8	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Where hydroelectric dams exist, efforts should be made to enforce run-of-river regulations through regular monitoring of gauges, in order to ensure mussel reproduction and recruitment. Research should be directed to investigating the impacts of flow management on mussel reproduction. Long-term management agreements should be developed with major landowners and hydropower suppliers to protect mussel populations. Information is needed on the species' loss and recovery potential after drawdowns for dam repairs and dam removals.	1, 7, 8	13

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Water conservation planning should be a high priority for managers. A statutory basis for withdrawing water should be developed in unprotected watersheds, including a review of all urban development proposals in terms of the effects of projected water withdrawal from lakes, rivers, streams, and wells on aquatic populations. Research should be directed to determine safe water yield levels in aquatic systems that support mussel species and other aquatic and terrestrial species of conservation concern, and include water budgets, inputs, and outputs.	1, 7, 8, 9	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Efforts should be made to address the impacts on the species' habitat outside of its core range, and incorporate protection in wetlands legislation and land-use planning.	21	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Mitigation guidelines would be helpful, and the effectiveness of mitigation measures should be assessed.	21	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Research is needed on the effects of roadway runoff from bridges and along rivers on mussel species. Studies should target water sampling during rain events. Efforts should be made to reduce urban runoff by coordinating with localities and state transportation departments to determine appropriate locations of planned roads. Recommendations of appropriate catch basins and stormwater drainage systems should be made as part of this process in order to reduce stream pollution and the direct mortality of mussels, fish, reptiles, and amphibians.	9	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Regional guidelines should be developed to help states incorporate these recovery strategies into their management plans.	21	13
Yellow lamp mussel (<i>Lampsilis cariosa</i>) - Model state statutes should be developed addressing the collection of mussels for personal and commercial use. In states where populations exist without legal protection, steps should be taken to review their status and initiate protection measures.	21	13
Brook floater (<i>Alasmidonta varicosa</i>) - Concerted surveying and long-term monitoring efforts should be initiated to determine and track demographic and abundance trends of populations, and to maintain and monitor water quality.	1, 7, 18	14
Brook floater (<i>Alasmidonta varicosa</i>) - Life history and ecological studies are needed, including in-stream flow requirements, and fish host identification and interactions.	1, 7	14
Brook floater (<i>Alasmidonta varicosa</i>) - Studies are needed to understand reasons for decline and habitat requirements, which seem to vary geographically from north to south.	1, 7	14
Brook floater (<i>Alasmidonta varicosa</i>) - Genetic studies are also needed to determine the possibility of hybridization with <i>A. marginata</i> .	1, 7	14

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Brook floater (<i>Alasmidonta varicosa</i>) - Where hydroelectric dams exist, efforts should be made to enforce run-of-river regulations through regular monitoring of gauges in order to ensure mussel reproduction and recruitment. Research should be directed to investigating the impacts of flow management on mussel reproduction.	1, 7, 8	14
Brook floater (<i>Alasmidonta varicosa</i>) - Water conservation planning should be a high priority for managers. A statutory basis for withdrawing water should be developed in unprotected watersheds, including a review of all urban development proposals in terms of the effects of projected water withdrawal from lakes, rivers, streams, and wells on aquatic populations. Research should be directed to determine safe water yield and flow levels in aquatic systems that support mussel species and other aquatic and terrestrial species of conservation concern, and include water budgets, inputs, and outputs.	1, 7, 8, 9	14
Brook floater (<i>Alasmidonta varicosa</i>) - Efforts should be made to address the impacts on this species' habitat outside of its core range, and incorporate protection in wetlands legislation and land-use planning.	21	14
Brook floater (<i>Alasmidonta varicosa</i>) - Multi-state agricultural and timbering BMPs should be encouraged, and enforced where mandatory, in an effort to control runoff containing herbicides, pesticides, fertilizers, and silt. Efforts should be made to promote the fencing of livestock from streambeds and the maintenance of riparian buffers through incentive and stewardship programs. Solar wells should be considered as an alternative to watering livestock in rivers.	15, 16, 21	14
Brook floater (<i>Alasmidonta varicosa</i>) - Research is needed on the effects of roadway run-off from bridges and along rivers on mussels and other aquatic species. Studies should target water sampling during rain events. Efforts should be made to reduce urban run-off by coordinating with localities and state transportation departments to determine appropriate locations of planned roads. Recommendations of appropriate catch basins and stormwater drainage systems should be made as part of this process in order to reduce stream pollution and the direct mortality of mussels, fish, reptiles, and amphibians. Regional guidelines should be developed and published to help states incorporate these recovery strategies into their management plans.	9	14
Brook floater (<i>Alasmidonta varicosa</i>) - Any management plans for increasing beaver populations in the Northeast should include consideration of the degradation of mussel habitat through increased siltation of streams and alteration of stream flow.	21	14
Brook floater (<i>Alasmidonta varicosa</i>) - Mitigation guidelines would be helpful, and the effectiveness of mitigation measures should be assessed.	21	14

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Brook floater (<i>Alasmidonta varicosa</i>) - In states where populations exist without legal protection, steps should be taken to review their status and initiate protection measures.	21	14
Native Freshwater Mussel species - Monitor and manage for the threat to native mussels from competition by invasive exotic species: Zebra mussel (<i>Dreissena polymorpha</i>); Rusty crayfish (<i>Orconectes rusticus</i>); Asian clam (<i>Corbicula fluminea</i>); Mosquito fish (<i>Gambusia spp.</i>)	1, 3	1
Odonate sp. - Monitor and determine size of existing odonate populations (exuviae counts)	1, 7	17
Odonate species – at least 21.7% of the odonate fauna in Connecticut can be regarded as rare; comprehensive wildlife management plans should emphasize and include the conservation of odonate fauna	1, 7, 18, 19	18
Sparkling Jewelwing (<i>Calopteryx dimidiata</i>) - Survey rivers and streams in eastern Connecticut near RI boarder; monitor existing populations	1, 7	17
Tiger Spiketail (<i>Cordulegaster erronea</i>) - Seepages and forested streams poorly surveyed; Danbury site impacted by trash; effort needed to prevent dumping into wetland; monitor existing populations.	1, 7	17
Midland Clubtail (<i>Gomphus fraternus</i>) - Minimize recreational impact on sandy beaches along Connecticut River and degradation to water quality.	1, 7, 9, 17	17
Harpoon Clubtail (<i>Gomphus desertus</i>) - Develop relationship with Hollenbeck Fishing Club to minimize impact of agricultural practices along river.	15, 19	17
Rapids Clubtail (<i>Gomphus quadricolor</i>) - Determine location and size of population on Farmington River in vicinity of Simsbury A.P.; conduct larval surveys	1, 7	17
Rapids Clubtail (<i>Gomphus quadricolor</i>) - Conduct surveys and monitor odonate populations in rivers and streams with fast current (riffle and rapids); determine location and size of population on Farmington River.	1, 7	17
Skillet Clubtail (<i>Gomphus ventricosus</i>) - Conduct surveys	1, 7	17
Matched Clubtail (<i>Gomphus adelphus</i>) - Extant population adjacent to picnic area in Devil's Hopyard S.P.; recreational activity may pose threat; conduct surveys on Natchaug and Nepaug Rivers; monitor existing population	1, 7	17
Crimson-Ringed Whiteface (<i>Leucorrhinia glacialis</i>) - Conduct surveys and monitor existing populations	1, 7	17
Riverine Clubtail (<i>Stylurus amnicola</i>) - Minimize recreational impact on sandy beaches along Connecticut River and degradation to water quality.	17	17
Ringed Boghaunter (<i>Williamsonia lintneri</i>) - Conduct surveys in sphagnum wetlands of Pachaug State Forest (last documented 1984 - likely overlooked); monitor and determine size of existing populations (exuviae counts).	1, 7	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Ringed Boghaunter (<i>Williamsonia lintneri</i>) – coastal lowlands, including sandy coastal plain ponds, Atlantic white cedar swamps and bogs, should be conserved as habitat	1, 7, 17	18
Comet Darner (<i>Anax longipes</i>) - Determine if breeding population exists at East Mountain Reservoir (Waterbury)	1, 7	17
Atlantic Bluethroat (<i>Enallagma doubledayi</i>) - Survey additional coastal plain ponds in SE Connecticut; monitor existing populations.	1, 7	17
Little Bluethroat (<i>Enallagma minusculum</i>) - Survey additional coastal plain ponds in Eastern Connecticut; monitor existing populations.	1, 7	17
Scarlet Bluethroat (<i>Enallagma pictum</i>) - Survey additional coastal plain ponds in Eastern Connecticut; monitor existing populations.	1, 7	17
American Rubyspot (<i>Hetaerina americana</i>) - Monitor existing populations, conduct surveys on other large rivers across state.	1, 7	17
American Rubyspot (<i>Hetaerina americana</i>) – the Connecticut River Valley, including the sandy beach and sand bar communities, is an area of conservation concern for this uncommon dragonfly	1, 7	18
Blue Corporal (<i>Ladona deplanata</i>) - Survey additional coastal plain ponds; monitor existing population.	1, 7	17
Ski-tailed Emerald (<i>Somatochlora elongata</i>) - Additional survey work required to evaluate species status.	1, 7	17
Dusky Dancer (<i>Argia translata</i>) - Conduct surveys on other large lakes and rivers in Western Connecticut.	1, 7	17
Dusky Dancer (<i>Argia translata</i>) - the Connecticut River Valley, including the sandy beach and sand bar communities, is an area of conservation concern for this uncommon dragonfly	1, 7	18
Banded Pennant (<i>Celithemis fasciata</i>) - Survey additional coastal plain ponds in Southern Connecticut; monitor existing populations.	1, 7	17
Martha's Pennant (<i>Celithemis martha</i>) - Survey additional coastal plain ponds in Southern Connecticut; monitor existing populations.	1, 7	17
Umber Shadowdragon (<i>Neurocordulia obsoleta</i>) - Conduct surveys on other large rivers, lakes, and reservoirs; identify emergence sites along Connecticut River.	1, 7	17
Stygian Shadowdragon (<i>Neurocordulia yamaskanensis</i>) - Conduct surveys on other large rivers in state	1, 7	17
Variable Darner (<i>Aeshna interrupta</i>) - Additional survey work required to evaluate species status.	1, 7	17
Common Spreadwing (<i>Lestes disjunctus australis</i>) - Conduct surveys and monitor existing populations	1, 7	17
Common Sanddragon (<i>Progomphus obscurus</i>) - Additional survey work required to evaluate species status.	1, 7	17

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Species-Focused Conservation Action	Threat Addressed	Source
Butterfly species - It is impossible to manage favorably for all butterfly species native to a given habitat; manage for localized and specialized butterflies, the generalists will come; aim to keep the butterflies already there rather than getting a new set of butterflies; no one management approach is best for all the species in a given habitat	1, 7	18
Butterfly species - Conduct surveys annually to ultimately assess management practices for butterflies; numbers will show trends in fluctuations following management	1, 7	18
Butterfly species - Use burning, herbicides and plowing as minimally and as sparingly as possible in localized applications addressing specific habitat problems for butterfly management	1, 7, 9	18
Butterfly species - When it is necessary to hay, practice rotational haying for butterfly habitat management. Cutting ¼ to 1/3 of the habitat patch in midsummer is recommended. Remove cut hay so vegetative regrowth won't smother and stunt under the dead clippings	1, 7, 15	18
Butterfly species – best to avoid both over-management and under-management. Butterflies do better in areas rested several seasons rather than in areas intensely managed.	1, 7	18
Northern metalmark (<i>Calephelis borealis</i>) – manage limestone ridges for this specialized butterfly in Connecticut	1, 7	18
Harris' checkerspot (<i>Chlosyne harrisii</i>) – manage wet shrubland for this specialized butterfly in Connecticut	1, 7	18
Acadian hairstreak (<i>Satyrrium acadica</i>) – manage wet shrubland for this specialized butterfly in Connecticut	1, 7	18
Bronze copper (<i>Lycaena hyllus</i>) – manage wet meadows for this specialized butterfly in Connecticut	1, 7	18
Falcate orange-tip (<i>Anthocharis midea</i>) – manage traprock ridge for this specialized butterfly in Connecticut	1, 7	18
Colonial invertebrate species - Target sponges, bryozoans, and corals, which have limited dispersal capabilities, that need protection from effects of fishing bycatch. In most cases, the death of these important invertebrates is never recorded. For species that already have small populations or limited geographic ranges, it takes only the loss of a few breeding age specimens or colonies to have strong negative effects on population size and stability.	1, 7, 18, 19	23
Crayfish - 162 of the 338 crayfish native to the United States are in need of conservation recognition.	1, 7, 18, 19	1

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
--	------------------	--------

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
In the U.S., the formal listing of species as threatened or endangered under federal or state endangered species legislation has been an extremely effective habitat protection tool because (1) these species are protected by law and (2) money is allocated for recovery efforts.	18, 19	2
Listing as “sensitive” or “indicator species” under U.S. Forest Service National Forest Management Act regulations, or even a formal listing from nongovernmental organizations such as IUCN and the Natural Heritage Program, raises visibility and an awareness of these species. This increased attention may lead to the stricter legal protection of a federal listing under the U.S. Endangered Species Act.	18, 19	2
In the long run, more emphasis needs to be placed on invertebrate survey, systematics, taxonomy, and population ecology so that these species can be identified, cataloged, and their life histories understood. Research needs to go hand in hand with conservation, for there is little use for a catalog of extinct species.	7, 18, 19	2
A review of current U.S. Endangered Species Act listings and policies show that this endangered species program is biased toward vertebrates. We believe there is compelling evidence that agencies, scientists, conservationists, and land managers should do more to promote the conservation of imperiled invertebrates.	18, 19, 21	3
The formal listing of species as threatened or endangered under federal or state endangered species legislation, as sensitive or indicator species under U.S. Forest Service National Forest Management Act regulations, or even under lists from nongovernmental organizations such as IUCN, has been an extremely effective habitat protection tool. Groups and individuals should work to protect invertebrates as well as more charismatic megafauna and ensure that agencies and land managers realize the importance of conserving invertebrates. In some cases, legal action may be needed to ensure that federal agencies follow laws, such as the ESA.	18, 19, 21	3
Before we can work to protect some invertebrates we need to at least know if populations are stable or declining, and we need to understand their habitat needs. Many invertebrates have not even been identified. In the long run, more emphasis needs to be placed on invertebrate systematics and taxonomy so that these species can be identified and cataloged. Research needs to go hand in hand with conservation, for there is little use for a catalog of extinct species.	7, 18	3
Successful conservation of invertebrates requires a greater understanding by the general public, scientists, land managers, and conservationists of the extraordinary value that these organisms provide. It is unlikely that very many people will develop affection or an affinity for these animals, but it plausible that a more compelling depiction of invertebrates' extraordinary contributions to human welfare and survival will do much to improve the public attitude toward these organisms. An ambitious public education program is needed to enhance the recognition of invertebrates' positive values, and indeed, of all biological diversity.	19	3

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Develop education programs to counter environmental policy that often overlooks invertebrates despite their staggering importance, and despite the catastrophic loss of so much invertebrate life. The general public also seems largely unaware of invertebrates' potential impact on human well-being. Many in the general public view invertebrates with aversion, fear, avoidance, and ignorance. Scientists, and to a lesser extent conservationists, have more favorable attitudes toward invertebrates, but still favor vertebrate over invertebrate species in research, education, and conservation action.	19	3
Hire a fulltime, dedicated Invertebrate Biologist to manage the approximately 143 state listed invertebrates (e.g., collect and submit element occurrence data from public and private collections and state-funded surveys, conduct surveys and monitor populations, and provide meaningful summary data)”	18	17
Ensure that local land-use decisions maintain the integrity of the conservation targets at Salmon River Project. Establish and maintain relationships with town leaders, TNC staff, and agencies and organizations that can most influence conservation success. Secure conservation of parcels that are most critical to the integrity of the targets. Ensure that state lands are managed for integrity of the targets, as well as for forestry and recreation.	19, 20	19
Work to directly protect the top 25 parcels in the Eightmile River Project landscape to protect rivers and forest targets; work with and promote protection by partners, finding new land protection partner funding, establishing viable methods for limited development such as the Land Bank concept, and facilitating increased open space capacity through bonding with local municipalities.	19, 20	19
Seek Congressional Wild and Scenic River designation for the Eightmile River both for its protection from any adverse federally funded or permitted water resource projects, and for its role in mobilizing local protection efforts and a watershed management plan. Launching a municipal initiative to strengthen local planning and regulatory processes through organized outreach by a partnership of respected agencies and grassroots interests is also intended for the Eightmile watershed and potentially other towns in the project area.	19, 20	19
Develop municipally-based strategies to manage wastewater treatment systems, develop yard waste composting sites and be involved in the Phase II planning process to ensure best management practices for municipal maintenance of streets, catch basins, and storm water management	8, 9, 20	19
Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic invertebrate habitat	19	21

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Continue education and training for appointed and elected volunteers at the municipal level who oversee wetland regulation; improve guidance to better integrate wetland protection with surrounding upland areas and from impacts of stormwater management practices	1, 2, 9, 19, 20	21
Educate local decision-makers on how to deal adequately with nonpoint sources of pollution. Focus on the reduction of impervious surfaces, reduce blacktop and sidewalks, whenever feasible	9	21
Enhance the public’s understanding of resource conservation and natural diversity, and foster beneficial land use practices through educational programs and demonstration areas	19	21
In development projects, seek to avoid significant impacts to essential fish and wildlife habitats and migration corridors	20, 21	21
Strengthen public outreach efforts and encourage broad participation in the improvement of Long Island Sound. Develop improved educational material to better enable municipalities and the public to protect Long Island Sound and coastal waters.	19	21
Regarding flood hazard mitigation, continue to focus on non-structural solutions. Complete a feasibility study for a more comprehensive coastal flood monitoring and warning system.	8	21
Regulate and monitor pesticide application in Connecticut to prevent environmental contamination and implement strategies and programs to restore polluted areas. Strive to attain the benchmark of 100% of certified pesticide applicators practicing Integrated Pest Management for structural pest control by the year 2015.	9, 15, 19	21
Minimize impacts from residential development by clustering homes together, maximizing forest patch size, minimizing fragmentation, and maximizing connectivity; site roads and utility corridors to reduce fragmentation and landscape with native vegetation where possible	1, 2, 20	21
Enhance the public’s understanding of resource conservation and natural diversity, and foster beneficial land use practices through educational programs and demonstration areas.	19	21
In development projects, seek to avoid significant impacts to essential fish and wildlife habitats and migration corridors.	20	21
Continue to test and promote a drainage basin approach to comprehensive nonpoint source management to control multiple pollutants and sources, utilizing existing programs and authorities. Plan, design, and implement a coastal nonpoint source program in cooperation with NOAA, EPA, regional, and local interests.	21	21

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Develop contaminated sediment clean up standards and a strategy for action with federal assistance from EPA. Update and refine the plan for the management of dredged material disposal in Long Island Sound.	21	21
Establish a nitrogen reduction schedule and targets for all Long Island Sound management zones and allocate loads among the individual discharges via permit limits.	12, 21	21
Implement coastal area management policies (C.G.S. Sec. 22a-92and 22a-100) to improve water quality of Long Island Sound.	12	21
Continue to assess opportunities for toxic pollution prevention in all permits. Continue to improve implementation of state regulations through clearly stated requirements, timely permit processing, proper enforcement, and the provision of technical assistance.	9, 19	21
Encourage the use of integrated pest management practices. Through education and outreach programs, educate people about safer and less toxic alternatives.	9, 15	21
Move the Aquifer Protection Program forward with the adoption of the first phase of land use regulations, which will enhance the state’s groundwater pollution prevention efforts.	19	21
Improve stormwater management by use of natural systems, such as grass swales, minimizing impervious surfaces, and groundwater recharge.	20	21
Promote best available control methods to nonpoint pollution sources including sludge and industrial waste disposal; highway, urban, silvicultural and agricultural runoff; and erosion from construction sites.	20	21
Aggressively correct nonpoint sources of pollution through regulatory and nonregulatory methods, including best management practices. Utilize preventive measures, such as vegetative buffers, in the management of this type of pollution. Educate local decision-makers on how to deal adequately with nonpoint sources of pollution. Focus on the reduction of impervious surfaces, reduce blacktop and sidewalks, whenever feasible.	9, 19	21
Build capacity for municipalities to take appropriate actions to prevent and control nonpoint pollution through the provision of technical support and training to municipalities and the development of local nonpoint pollution control programs. As a part of these programs also have municipalities address stream hydrology, aquifer recharge, and stormwater quality. Provide incentives, wherever feasible, for municipalities to develop programs to address these issues.	19	21
Promote best available control methods to nonpoint pollution sources including sludge and industrial waste disposal; highway, urban, silvicultural and agricultural runoff; and erosion from construction sites	9, 15, 20	21
Encourage the use of soil and water conservation practices to retain agricultural productivity and to lessen the on-site and off-site impacts of erosion, sedimentation, and animal wastes	9, 15	21

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Encourage the use of less toxic pesticides and herbicides and Integrated Pest Management practices where appropriate	9, 15	21
Seek to achieve no net loss of wetland resources through development planning that avoids wetlands whenever possible, minimizes intrusion when it cannot be avoided, and mitigates unavoidable impacts through wetland enhancement or creation	1, 2, 5, 21	21
Regulate the harvest of shellfish species from natural beds under state jurisdiction. Advise municipalities in the regulation of shellfish harvests from waters under town jurisdiction to promote a safe product and sustained yields. Work with town officials on shellfish law enforcement.	14, 19	21
Promote Connecticut’s commercial and recreational fishing and aquacultural industries consistent with marine productive capacities.	14, 19	21
Offer technical assistance to regulatory agencies, municipal and private landowners, and conservation organizations in the protection and conservation of aquatic habitat.	19	21
Continue the comprehensive framework for making water allocation decisions, so as to integrate existing programs and procedures. In cooperation with the Department of Public Health, formulate an allocation policy for the Department of Environmental Protection and agree upon an instream flow standard.	8, 19	21
Continue to improve the quality of ground and surface water through a combination of pollution prevention and pollution abatement practices. Continue to maintain the quality of those waters of the state that are already at a high standard. Lower water quality standards only if it can be affirmatively demonstrated that it is the result of necessary economic or social development. Lower standards should not interfere with, or become injurious to, existing or potential uses. Reclassify groundwater if polluted by past intense urban, commercial, or industrial development.	9, 19	21
Evaluate the effect of aquaculture activities on wild fish, invertebrate, bird, reptile and marine mammal resources considering placement of cultch, cages, pens and similar structures as well as mechanical disturbance from hydraulic dredging.	14, 19	22
Respond to emerging problems in environmental management including the effects of water or sediment quality, disease, thermal stress, storms, chemical contaminants and major pollution events to evaluate their impacts on aquatic living resources	9, 18, 19	22
Develop and maintain a GIS database of marine habitats and marine invertebrates	18	22
Inventory and assess the distribution and quality of the major habitat types in Long Island Sound and adjacent estuaries including rocky reef, kelp, sponge, shell, sand wave and eelgrass habitats	1, 7, 18	22

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Examine the abundance and distribution of benthic macroinvertebrates and evaluate their importance as a food source for fish.	1, 7, 18	22
Inventory lobster spawning grounds throughout Long Island Sound using larval and/or juvenile surveys and assess the relative importance of areas potentially impacted by human activities	1, 7, 18	22
Develop an inventory of existing species and their historical abundance for each regional marine ecosystem	7, 18	23
Evaluate the effect of aquaculture on invertebrates, considering placement of cultch, cages, pens and similar structures	14,	22
Evaluate the effect of towed fish and shellfish gear on bottom habitat and invertebrates and of ghost fishing gear.	14	22
Evaluate the impacts of introduced species, such as the Japanese shore crab, on native species	3	22
Establish water quality standards for nutrients in rivers, lakes, estuaries, and coastal waters; establish ambient water quality standards for nitrogen, and on a watershed-by-watershed basis identify additional nutrients and toxic pollutants for which water quality standards are needed	9, 12	23
Require watershed-based water quality compliance planning	8, 9	23
Provide a complementary suite of incentives for improving water quality and disincentives for activities that harm water quality	9	23
Municipalities and counties should change their zoning and subdivision codes to promote compact growth near urban centers, to discourage growth outside town centers in rural areas, and to reduce impervious surface cover wherever possible	8, 9, 20, 21	23
Require local growth-management planning as a condition for receipt of state and pass-through federal development assistance, and ensure that state and local growth and transportation planning comport with statewide habitat protection plans	20, 21	23
Coordinate policies and practices among local jurisdictions and, to the extent possible, with adjacent states to ensure a rational regional approach to growth management	20, 21	23
Fund development of biological nutrient removal technology standards to reduce nitrogen loads from publicly owned treatment works and for municipalities to install biological nutrient removal treatment in watersheds where such loads are a significant source of water quality impairment	9	23
Evaluate requiring the utilization of best available sound control technologies, where the generation of sound has potential adverse effects	9	23
Support the study of the effects of toxic substances in the marine environment	9, 10	23

CONNECTICUT’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Become engaged in local and regional land use planning at selected landscape-scale sites	1, 20, 21	24
Secure additional funding for invasive plant initiatives	3	24
Strategic education initiatives in a comprehensive wildlife plan should include the importance of invertebrates for healthy ecosystems	19	18
How many Connecticut residents realize that freshwater mussels even exist, let alone that many are imperiled? Freshwater bivalves are among the most endangered groups of organisms in North America. A comprehensive wildlife management plan should include specific education initiatives relating to freshwater mussels	19	18
Create and maintain a centralized database of all DEP activities distributed to all staff workstations. This system would not have specific data, but would track the fact that data exist for a particular place. Data would be entered as they were collected. One would query by location to see if anyone collected data from that location, and if data exist it would be up to the requestor to track down the actual data. It would require revamping the IT department.	18, 19	25
Establish a single GIS projection standard for all DEP departments to share data layers more effectively.	18, 19	25
ECO system, GIS access program that has potential for more layers as they become available. Safeguards of all historical data with historic layers of past land use, spills, kills, violations, etc.	18, 19	25
Maintain records of survey data, management data and other data types in compatible GIS layer	18, 19	25
BioMap of Connecticut – to identify and map the areas most critical to protecting the state’s biodiversity and conducting gap analysis	18, 19	25
GIS mapping at the county or watershed level – habitat types, DEP lands, open space lands, contiguous forest cover, agricultural lands, etc. Determination of how much grassland, shrubland, vernal pools, etc. remains	18, 19, 20	25
Complete phase II of the WMA GIS habitat mapping project that involves ground truthing and additional aerial photo interpretation	18, 19	25
Develop an invasive plant and animal species database – much like the T and E database, so that the spread or containment of invasives can be monitored. Conduct a state lands invasive plant inventory/GIS mapping contract.	18, 19	25
Establish and maintain a database with all pertinent wildlife information such as surveys, habitat types, etc. for use by DEP Wildlife Division personnel (like ECOS but specific to Wildlife Division)	18, 19	25

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

“Other” Conservation Action (including policy and education)	Threat Addressed	Source
Contract a professional to research and investigate the best options for securing stable funding for the Division as a whole and/or specific programs (i.e. habitat stamp, Act 490 expansion, tax on real estate conveyances, etc.) and to work on developing a more positive Division image known to a larger segment of the public	18, 19	25
Purchase a brontosaurus for conducting work on both state and private land and contract or durationally hire someone to operate it.	18, 19	25
Conduct 4 WMA natural resource inventories per year to obtain baseline information on which to base sound management decisions. There are a total of 90 WMAs statewide. Contract a GIS specialist to complete/conduct GIS habitat mapping of all WMAs, followed by state forests and other DEP lands managed specifically for wildlife. Information would include habitat types, forest stand types and age classes, capitol improvements, T and E species, etc.	18, 19	25
Contract a biologist to develop a statewide forest/wildlife strategic plan that addresses where we are now, sets specific objectives on where we need to be in regards to biological old growth areas, seedling sapling areas, varying rotation lengths, cutting periods, etc.	18, 19	25
Re-visit county by county large 2,500 acre forest parcels to address forest fragmentation issues	18, 19, 20	25
Properly manage the approximately 1,500 acres DEP administered agricultural lands principally on WMAs for wildlife species rather than just providing cheap land for local farmers.	18, 19, 15	25
Expand/improve “Connecticut Wildlife” to include outside authors, full color, etc. Expand the role/impact of Public Awareness.	19	25
Fund appropriate improvements/maintenance and professional staff for one or two demonstration sites in the state (Sessions and perhaps Goodwin)	18, 19	25
Coordinate the effort of the LIP program and SWG to effect habitat management on private land, which comprises most of the habitat for species of greatest conservation need in Connecticut	18, 21	25

Appendix 5:

NOTE: Appendices are numbered to correspond to each chapter and required element. There are no appendices for chapters and elements 5 and 6.

Appendix 6:

NOTE: Appendices are numbered to correspond to each chapter and required element. There are no appendices for chapters and elements 5 and 6.

Appendix 7a: Connecticut's Wildlife Conservation Partners and Programs

This appendix describes the key federal, state, local, and tribal partners and their programs as part of Connecticut's overall wildlife conservation delivery system. Many of these conservation programs are collaborative efforts. This list is not comprehensive, but presents the key partners and programs, as required in Element 7, that administer or manage significant land and water resources in the state. These groups are considered important stakeholders and their input was solicited throughout this CWCS process.

Department of Environmental Protection Programs

The mission of the Department of Environmental Protection (DEP) is to conserve, improve, and protect the natural resources and environment of the State of Connecticut in such a manner as to encourage the social and economic development of Connecticut while preserving the natural environment and the life forms it supports in a delicate, interrelated, and complex balance, to the end that the state may fulfill its responsibility as trustee of the environment for present and future generations. The Department of Environmental Protection in Connecticut contains several bureaus, the Environmental and Geographic Information Center (EGIC), and several programs that manage the natural resources of the state and public access to outdoor recreational activities on state lands (<http://dep.state.ct.us/aboutdep/progacti.htm>). The Office of the Commissioner includes several centralized programs and offices that organize, coordinate, and provide technical assistance to the DEP bureaus, the public, tribal entities, and the business community.

The Environmental Equity Program (formerly the Office of Urban and Community Ecology) incorporates the principles of environmental equity into the agency's program development, policy-making, and regulatory activities. The program also develops, oversees, and implements strategic plan environmental equity components; formulates program goals and objectives; and develops related policy and legislative proposals.

The Greenways Assistance Center maintains a registry of successful greenway projects and a library of greenway literature, maps, videos, and organizations. The Center also provides information on grants for project planning and development and planning assistance to municipal boards and commissions. Greenways Assistance Center staff assists in the technical aspects of project design, coordination, and planning and in the coordination of public-private greenway partnerships.

The Natural Areas Preserve Program consults and cooperates with conservation and naturalist groups and organizations in the acquisition and maintenance of preserves and prepares detailed management plans for existing preserves. The program also initiates scientific surveys of existing preserves to document present status, trends, and problem sources and acts as the official repository of

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

natural area preserves documentation, including deeds, maps, records, surveys, and designations. Following a detailed statewide survey, the program proposes consideration of carefully selected natural features for nomination as preserves. Program staff officiates as chair of the Natural Area Preserves Advisory Committee and cooperates with the committee in the conduct of its duties. The program also acts as the Commissioner's agent for the selection, care, control, supervision, and management of all natural area preserves within the system to the extent of the interest held by the state.

The Office of Environmental Review responds to National Environmental Policy Act (NEPA) and Connecticut Environmental Policy Act (CEPA) issues. The office advocates environmental issues and mitigation measures beyond regulatory jurisdiction, acts as the single point of contact for the DEP, and coordinates and formulates a comprehensive Departmental response on NEPA issues. The Office of Planning and Development oversees the Environment/2000 (E/2000) Connecticut's Environmental Plan – monitoring progress of its implementation, as well as coordinating and drafting revisions to the plan. This office organizes and staffs regular and special Commissioner's E/2000 Advisory Board Meetings, organizes the annual E/2000 public conference and Governor's environmental awards, and coordinates the E/2000 plan and board priority recommendations with DEP bureau strategic plans.

The Communications Division provides administrative support for media relations and public information for the DEP, assists the Commissioner and senior staff in the development of policy and public statements, and provides technical assistance to the Commissioner and senior staff on key public policy positions and statements on environmental issues. The Environmental Education Division provides departmental administrative support; coordinates requests for speakers, exhibits, videos, or other materials that explain the DEP and its variety of programs; manages the Core Curricula (Projects Wild, Learning Tree, Wet) and SEARCH Programs (student-science projects); and provides environmental education services for municipal officials, students, and the general public. The Publications Division produces a biweekly departmental newsletter, assists other DEP units with publications, and is the liaison with other state entities on legal publications.

The Indian Affairs Coordinator, provides tribal contacts and information, and acts as the Commissioner's designee to the Connecticut Indian Affairs Council (CIAC), prepares DEP's and other state agencies' comments, concerns, and recommendations to the CIAC, advises the CIAC regarding state policy and concerns, and acts as the single point of public contact for all Indian-related issues.

The Office of Ombudsmen assists applicants in understanding the environmental permitting process and coordinates and expedites permit applications for new and expanding businesses; maintains an information hotline; coordinates with the Small Business Assistance Program/Clean Air Ombudsman to help small businesses understand and comply with the requirements of the Clean Air Act; and performs many other functions within the DEP. The Bureau of Financial and Support Services provides fiscal and administrative support to the Department.

The DEP also contains the Commissioner's Legal Counsel, a Legislative Liaison, and staff for adjudications. The Office for Long Island Sound Programs and the Environmental and Geographic Information Center are also located within the DEP.

Bureau of Natural Resources

The mission of the DEP Bureau of Natural Resources is to manage the state's natural resources and to provide the public with continued recreational and commercial opportunities for enjoyment and use of Connecticut's natural resources through a program of regulation, management, research, public education, and conservation law enforcement. The Bureau applies fish, wildlife, and forest management principles and conducts scientific investigations and assessments to protect Connecticut's natural resources and their habitats and to ensure continued natural resource based recreational and commercial opportunities.

The Bureau consists of three divisions and a planning, coordination, and fiscal management office (<http://dep.state.ct.us/burnatr/index.htm>). The three divisions are divided into Wildlife, Fisheries, and Forestry. Each of these divisions is briefly introduced here, with detailed information about conservation programs and projects within each of these Divisions provided in the following sections.

The Wildlife Division manages the wildlife resources of the state to provide stable, healthy populations of diverse wildlife species, including endangered and threatened species, in numbers compatible with both habitat carrying capacity and existing land use practices; conducts public awareness and technical assistance programs to enhance privately-owned habitat and promote an appreciation for and understanding of the value and use of Connecticut's wildlife; manages wildlife habitat on state forests and wildlife management areas; regulates hunting seasons and bag limits for all harvestable wildlife species within Connecticut; manages public hunting opportunities on state-owned, state-leased and permit-required areas; and conducts, with volunteer assistance, conservation education and safety programs to promote safe and ethical hunting practices.

The Fisheries Division manages Connecticut's fish to provide sustainable populations, including endangered species, commensurate with habitat capability and relevant ecological, social, and economic considerations; regulates and manages anadromous, marine commercial and recreational fisheries consistent with interjurisdictional management plans and target harvest objectives; regulates and manages inland fish populations and habitat through various stocking, population manipulation, and habitat preservation and improvement programs; protects and conserves aquatic habitat and associated riparian zones by reviewing and commenting on permit applications for development, water diversion, and habitat alteration; and conducts public awareness and educational programs to promote an understanding and appreciation for aquatic resources and habitats.

The Forestry Division manages state-owned forest lands for long term health and vigor, as well as multiple uses for a variety of interests through forest monitoring, tree harvest, forest fire protection, and forest conservation education; provides technical assistance to forest land owners for wood production, recreation, watershed management, wildlife habitat and aesthetics; provides marketing support to Connecticut's primary and secondary processors of wood products and conducts an urban tree planting and management program; operates a tree nursery for state forestry programs and to supply forest planting stock at cost to Connecticut residents; conducts an aggressive forest fire prevention control program, including training for municipal fire departments, provision of specialized fire equipment, administration of federal funds to rural fire departments, public education and participation in the Northwestern Forest Fire Protection Commission; certifies forest practitioners as per CGS Section 23-65h and designates land as "forest land" as per CGS Sections 12-96 and 12-107d.

The Planning, Coordination and Fiscal Management Office of the Bureau coordinates long-range planning for the management of Connecticut's fish, wildlife, forest and related land and water resources; coordinates the efficient and effective use of available Bureau fiscal and human resources to maximize benefits to both the public and the resources, and oversees fiscal management of the Bureau budget. This office is a recent addition to the Bureau's management structure, resulting from a reorganization of existing staff within the Bureau.

Bureau of Outdoor Recreation

The Bureau of Outdoor Recreation aims to provide for the conservation and management of statewide recreation lands and resources through the acquisition of open space and the management of resources to meet the outdoor recreation needs of the public (<http://dep.state.ct.us/rec/index.htm>). The Bureau accomplishes this mission by acquiring lands for conservation and recreation purposes, providing public use compatible with long term protection of the natural resources base, developing appropriate public facilities, participating in the state's tourism industry and, providing conservation law enforcement support to protect Connecticut's natural resources. They are currently involved in a planning process and developing an Outdoor Recreation Plan called SCORP (State Comprehensive Outdoor and Recreation Plan).

The Office of Planning and Fiscal Management conducts and coordinates long range, multiple-use resource plans for department managed recreation properties, coordinates special event programming for State Parks and administers trails programs, Greenways, Heritage Parks, and National Heritage Corridors.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The State Parks Division administers the planning, development, operations programs and maintenance of the lands and facilities within the state park system; provides for water based recreation within the state inland waters and beaches; manages a system of campgrounds based on natural resource sites; establishes and manages a statewide trail system of recreational trails; manages and operates historic and cultural sites; operates and maintains state boat launch access areas; provides for interpretation of historic and natural resources; and provides for the protection of the systems' resources through its park law enforcement personnel.

The Land Acquisition and Property Management Division reviews, appraises and develops proposals for acquisition or exchange of real property acquired by the Department of Environmental Protection; develops easement or leases for use of DEP land and tenants; surveys State land boundaries and investigates boundary disputes; manages property documents for department owned and managed lands; and coordinates state and federal funding programs for municipal outdoor recreation, open space acquisition and development. The Conservation Law Enforcement Division enforces fish and wildlife, shellfish, boating, park and forest laws and regulations; conducts law enforcement actions on the various permits issued by fisheries, forestry, parks and wildlife divisions; issues marine event permits; provides training and assistance to local, state and federal agencies with respect to enforcement of natural resource laws and regulations; and provides educational instruction on various wildlife topics to schools and civic organizations.

Bureau of Air Management

The objective of the Bureau of Air Management is to protect human health, safety and the environment and enhance the quality of life for the citizens of Connecticut by managing air quality, radioactive materials and radiation. The Bureau accomplishes its mission by controlling and reducing air pollution and by maintaining the most comprehensive monitoring network in New England for measuring air quality; by regulating the use, transportation and storage of radioactive materials and monitoring for radioactive accumulations from nuclear power plants; by developing and implementing regulations, policies, procedures and standards for carrying out Connecticut's air and radiation control laws and regulations; and by issuing air pollution control permits and taking appropriate enforcement action when laws or regulations are violated.

The Bureau consists of three divisions – the Planning and Standards Division, the Monitoring and Radiation Division, and the Engineering and Enforcement Division. Detailed descriptions of these divisions can be found on-line at <http://dep.state.ct.us/air2/index.htm>.

Bureau of Waste Management

The DEP's Bureau of Waste Management strives to protect public health, safety and the environment by minimizing adverse effects from the treatment, storage, disposal and transportation of solid and hazardous wastes, hazardous substances and pesticides. The Bureau achieves this mission by educating the public and by developing and implementing regulations, policies, procedures, standards, and grant programs to administer the existing and emerging federal and state waste management laws. The Bureau's range of responsibilities includes encouraging pollution prevention and recycling; developing necessary facilities for the proper management of solid waste, recyclable materials and non-recyclable hazardous waste; regulating the generation, transportation, treatment, storage and disposal of hazardous wastes; developing capacity and expertise to respond to emergency spill and contamination incidents; developing comprehensive programs for the environmentally safe transport, handling and disposal of petroleum products; and regulating the use of pesticides and minimizing human and non-target species exposure.

The Bureau consists of the Bureau Chief's Office, four divisions and the State Emergency Response Commission (<http://dep.state.ct.us/wst/index.htm>).

Bureau of Water Management

The mission of the Bureau of Water Management is to protect and restore the State's surface and ground waters, water-related resources that protect public water supply, human health and safety, hazard mitigation, river restoration, preserve and enhance water based recreation, propagation of fish and aquatic life, and the natural character and economic well being of the State of Connecticut.

The Bureau achieves its mission through the adoption of water quality standards for the State's surface and ground water resources, regulation of municipal and industrial wastewater discharges, management of water withdrawals, construction on and adjacent to coastal and inland water resources, enforcement of the water quality, mitigation of natural hazards, control of floodplain development, river restoration, water resource protection, remediation of waste disposal sites, monitoring and assessment of water quality, management of the Connecticut Clean Water Fund, and development of strategies to abate or prevent water pollution.

The Bureau consists of three divisions – the Planning and Standards Division, the Permitting, Enforcement, and Remediation Division, and the Inland Water Resource Management Division (<http://dep.state.ct.us/wtr/mission.htm>).

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The Inland Water Resource Management Division regulates activities in the State's inland wetlands and watercourses and floodplains, including oversight of municipal Inland Wetland Commissions; enforces the State's inland wetlands and floodplain protection statutes; manages allocation of water resources through diversion permitting; provides grants for river restoration; and prevents or mitigates natural disasters through flood warning and dam safety programs.

The Bureau of Water Management also conducts water quality monitoring in Connecticut's wade-able streams, rivers, lakes and estuaries. The water quality assessments utilize benthic macroinvertebrate and fish community analysis, ambient physical/chemical data, indicator bacteria monitoring and beach closures, intensive surveys, toxicity tests, sediment and tissue analyses and volunteer data (CT DEP 2004). Although the 2004 assessment report concluded that Connecticut's water quality has improved, it also concludes that there remains further room for improvement, especially in addressing nonpoint sources of pollution (CT DEP 2004).

Bureau of Natural Resources, Wildlife Division Programs

The Wildlife Division is within the Bureau of Natural Resources in the Department of Environmental Protection (<http://dep.state.ct.us/burnatr/wildlife/wdhome.htm>). The Division manages programs for nonharvested, harvested and urban wildlife. A Technical Assistance Program and the Outreach Unit allow the Division to share its expertise with the public, and publications produced by the Division are provided on the World Wide Web for widespread public distribution (<http://dep.state.ct.us/burnatr/wildlife/pdf.htm>). A Recreation Management Program provides the public with recreational opportunities throughout the state.

Wildlife Diversity Program

The Wildlife Diversity Program coordinates research and manages activities for nonharvested birds, reptiles, amphibians, invertebrates, and bats in Connecticut. Avian research and management activities include raptors, including eagles, ospreys and barn owls; shorebirds, including state and federally threatened piping plovers, state threatened least terns, and federally endangered roseate terns; songbirds, including bluebirds, and neo-tropical migrants such as cerulean warblers and upland sandpipers; and wetland birds, including pied-billed grebes, bitterns, herons and egrets. Reptiles and amphibian research and management includes state endangered bog turtles, and diamondback terrapins. Research and management of invertebrate species includes state endangered and federally threatened Puritan tiger beetles, state endangered banded bog skimmer dragonflies, state and federally endangered dwarf wedge mussels and brook floater mussels, a species of special concern. Bats also receive research and management attention from the Wildlife Division.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The Program also is responsible for managing Connecticut's threatened and endangered species and has produced a series of fact sheets on threatened and endangered species that are found in the state; these fact sheets are provided free to the public via the DEP website at <http://dep.state.ct.us/burnatr/wildlife/learn/esfact.htm>.

The Division also administers the state's "watchable wildlife" program which encourages public viewing of wildlife through installation of viewing platforms and the "Windows to Wildlife" program, which installs bird feeders, nestboxes, plantings and other habitat enhancements at nursing homes for the viewing benefit of residents.

Habitat Management Unit

The Habitat Management Unit strives to maintain, enhance, restore and manage quality habitat on both state and private lands in order to promote healthy and diverse populations of wildlife, especially state listed threatened, endangered, species of special concern and those considered at risk, and maintain and improve opportunities for wildlife-based pursuits, by providing outreach, technical assistance and implementation of a full range of on-the-ground wildlife habitat techniques.

State Lands Management

The State Lands Management Program works to maintain and improve a diversity of wildlife habitats on state lands in order to provide for the needs of all wildlife, but especially threatened, endangered and species of special concern, along with maintaining and improving wildlife-based recreational opportunities (including hunting and wildlife viewing). The Wildlife Division directly administers 90 wildlife management areas (WMAs), totaling 26,393 acres and also provides technical assistance and habitat management on thousands of acres of other state DEP lands such as state forests, flood control areas and natural area preserves. WMAs range in size from one to 2,200 acres and contain some of the best wildlife habitat in the state, including unditched coastal salt marshes, the state's largest inland marsh, high quality riparian zones along some of the state's major rivers, large expanses of cool and warm season grasslands, diverse forests, and extensive old fields and agricultural land. On the ground habitat management and development practices include old field restoration and shrubland management, riparian zone restoration, warm and cool season grass planting, prescribed burning, open marsh water management, excavation of shallow potholes, and control of invasive vegetation.

Private Lands Program

The Private Lands Program, initiated in late 2003 and made possible through the US Fish and Wildlife Service's Landowner Incentive Program (LIP), will provide technical and financial assistance to private landowners to benefit species "at risk" and the habitats that

support them, when fully implemented. Species “at risk” (both plants and animals) includes all federally listed species found in the state, all state listed threatened, endangered and special concern species as well as those considered at risk by the Division. Because the majority of the state’s species at risk are dependent on early successional and wetland habitats, LIP project funds will be directed toward these priority habitats and the imperiled natural communities found within them. Eligible projects under LIP will include old field and shrubland restoration, native warm season grass plantings, cool season grass plantings, invasive vegetation control, riparian zone restoration, open marsh water management and creation of shallow potholes. Conservation easements to protect critical habitat will also be funded in partnership with various conservation and sportsmen’s groups. The Private Lands Program will also coordinate all other available private land wildlife habitat funding initiatives (including the US Fish and Wildlife Service’s Partners for Fish and Wildlife and the USDA’s Farm Bill programs) to maximize benefits to priority habitats and the species at risk they support.

Harvested Species Assessment Programs

The CT DEP Wildlife Division has several programs for the management of harvested species, including deer, wild turkey, waterfowl, small game and furbearers. A series of hunting and trapping guides for Connecticut are publicly available at <http://dep.state.ct.us/burnatr/wildlife/fguide/fgindex.htm> and maintain up-to-date information on hunting and trapping regulations, seasons and locations. The Wildlife Division also provides hunting courses to the public on various safety issues; course information is available for the public at the DEP website <http://dep.state.ct.us/burnatr/wildlife/geninfo/cefs.asp>.

Deer Management Program

The Deer management Act of 1974 designated deer as a game species and established the authority of the Wildlife Division to manage the deer resource. The Wildlife Division’s Deer Management Program is responsible for maintaining healthy deer populations that are within biological and cultural carrying capacity through research, management and educational efforts. Research projects have been initiated to collect and evaluate data to monitor the health and distribution of deer. To develop effective management strategies for deer in urban areas, studies have been initiated to understand public perception about deer and deer management issues and to understand the population dynamics of deer in urban-suburban areas. Deer management activities have focused on modifying the regulated deer-hunting season framework to maximize hunter opportunities and prevent deer overpopulation from occurring. Since 1975, the bag limit has increased from 1 deer (either sex) per person per year up to 12 deer (5 antlerless and 7 either-sex) per person per year. In two of twelve deer management zones, hunters can harvest unlimited antlerless deer, and the archery season is open for 121 hunting days. In special areas with overabundant deer populations, innovated deer management programs have been developed to significantly reduce deer population size. Deer Program staff has developed informational booklets, prepared educational slide

presentations and often meet with town officials, homeowner associations, sportsmen groups or other special interest groups to discuss deer management issues.

Publications about the Wildlife Division's deer management program are provided to the public via the DEP website at <http://dep.state.ct.us/burnatr/wildlife/pdf.htm#Deer>.

Wild Turkey Program

Connecticut's wild turkey program began in earnest during the early 1970's. Prior to this point in time wild turkeys were extirpated from Connecticut. In the winter of 1975, the Wildlife Division obtained 22 wild turkeys, which were captured in New York and released in northwest Connecticut. During the next 3 years this population grew and expanded allowing the program biologists to begin in-state trap and transport efforts. Between 1977 and 1992, 334 wild turkeys were released in suitable habitat throughout the entire state. By 2000, wild turkeys had been documented in all 169 Connecticut towns and the population grew to over 35,000 birds.

The goal of Connecticut's wild turkey program is to manage wild turkey populations at levels compatible with available habitat and various land uses and to allow for a sustained yield of turkeys for use by the people of Connecticut. To reach this goal, program biologists have developed hunting programs and research projects. In May 1981, wild turkey hunting was permitted in Connecticut for the first time in 170 years. As the wild turkey population grew and expanded so did the hunting programs, which now include spring, fall archery, and fall firearms seasons. Research projects have included biological data collection on hunter-harvested birds, gobble count surveys, brood surveys and telemetry studies.

Publications about the Wildlife Division's wild turkey program are provided to the public via the DEP website at <http://dep.state.ct.us/burnatr/wildlife/pdf.htm#Turkey>.

Waterfowl Program

- In coordination with the U.S. Fish and Wildlife Service; inventories species populations, establishes season lengths and bag limits, determines harvest totals and the impact of harvest on waterfowl populations
- Conducts population surveys and banding studies
- Provides technical assistance to improve wetland habitats
- Provides technical assistance to resolve nuisance situations caused by geese and swans

Small Game Program

- Monitors species populations, establishes season lengths and bag limits, determines harvest totals and the impact of harvest on species populations
- Evaluates hunter use of permit regulated hunting areas

Furbearer Management Program

The Furbearer Management Program includes management, research and outreach activities for a diverse group of mammals. The mammal species include those currently or historically harvested primarily for their fur value. Many furbearers present management challenges as a result of their frequent conflicts with humans. Examples include bears, coyotes, beavers and raccoons. Response to these conflicts include educational and outreach efforts; regulatory and policy changes that affect harvest levels and removal options for citizens and nuisance wildlife control operators; and on-site evaluation and response by Department personnel. Education and outreach methods include responses to phone, mail or e-mail inquiries from the public, technical assistance publications, media interviews, presentations to groups, and meeting municipal officials. Annual harvest totals are either determined through pelt tagging or estimated by surveying trappers. A program that allows trapping on state properties is annually administered. Research is conducted to monitor population levels and to obtain biological information for selected species.

Conservation Education/Firearms Safety Program

The Wildlife Division's hunter safety program, known as the Conservation Education/Firearms Safety Program promotes an understanding of wildlife management and the development of safe and ethical hunters. Additionally, it fosters an increased awareness of the role that hunters and trappers have in managing the state's renewable natural resources. Connecticut legislation mandates that anyone applying for a firearm hunting, bowhunting or trapping license for the first time must complete the Conservation Education/Firearms Safety course in the respective sport. In addition to offering courses in the previously mentioned disciplines, the CE/FS program offers public outreach workshops in muzzleloading firearms, hunting wild turkey and hunting white-tailed deer. The highly motivated trained volunteer instructors, eager to convey their passion of hunting and trapping to another generation of sportsmen, present the hunting courses in nearly every town in the state throughout the year.

Technical Assistance Program

The Wildlife Division's Technical Assistance Program provides assistance to the public on nuisance wildlife complaints (<http://dep.state.ct.us/burnatr/wildlife/problem.htm>) and wildlife rehabilitation, which permits individuals to care for sick and injured

wildlife (<http://dep.state.ct.us/burnatr/wildlife/problem/rehab/rehab.htm>). Staff provides habitat improvement recommendations to private organizations and landowners, and other state agencies as well as conducting habitat improvements and administering agricultural agreements on state wildlife management areas.

Recreation Management Program

The recreation management program functions primarily to provide and promote a variety of quality public hunting opportunities on state and private lands. Pheasants are stocked annually to supplement native upland bird populations, increase hunting opportunity and meet demand from the fees-paying sportsmen. Public hunting access is managed through controlled access programs on state owned properties in addition to cooperative agreements or leases with sportsmen's organizations, private landholders, or public utilities. A Permit-Required Hunting Program is administered to control public access for small game hunting and offer a quality hunting experience in the field. Opportunities for specialized hunting-related activities including field dog trials and dog training for licensed hunters are provided on selected state areas that are managed for that purpose.

Outreach Unit

The Wildlife Division's ability to effectively manage Connecticut's wildlife depends upon broad public support. Therefore, the Division's Outreach Unit promotes wildlife stewardship and awareness through a variety of information, education and volunteer programs. The Outreach Unit develops, produces and distributes such informational materials as the bimonthly magazine, *Connecticut Wildlife*, fact sheets on wildlife and habitat, Division program summaries, *Just for Kids* pages, brochures, sighting cards and press releases. Education initiatives include workshops and classroom materials for teachers. The Outreach Unit is actively involved with developing interpretive exhibits and educational programs for the Wildlife Division's Conservation Education Center at the Sessions Woods Wildlife Management Area in Burlington. The unit is also responsible for the coordination of the Master Wildlife Conservationist Program, where adults receive concentrated training on various aspects of wildlife management. Trained individuals are then required to volunteer their services to wildlife research and outreach projects approved by the Wildlife Division.

Wetlands Habitat and Mosquito Management (WHAMM) Program

The Division's WHAMM Program promotes environmental stewardship and awareness and responsible mosquito management through a variety of wetland restoration and enhancement techniques, environmentally compatible mosquito management including the use of Open Marsh Water Management (OMWM), and information and education programs. In cooperation with other DEP staff, the WHAMM Program designs projects, applies for and receives permits and grants and implements wetlands restoration and

enhancement work and OMWM projects throughout Connecticut. The WHAMM Program has specialized low ground pressure equipment (excavators and dozers) and a full time dedicated staff that implements the work. Program staff also has informational materials about the program that are available both in print form and on the Department's website. The WHAMM Program restores or enhances approximately 300 acres of wetlands each year paid for by a variety of funding sources other than general funds of the state.

Natural History Survey

The Connecticut Natural History Survey is responsible for the coordination and implementation of statewide natural resource data collection inventories in the following areas: systematic inventories of fauna and flora, including endangered species; and the development and operation of resource oriented database management systems.

The Biological Science Section develops and implements basic data collection, analysis and interpretation of biologic resources in order to provide information about the character and distribution of all plants and animals of the state. Special emphasis is placed on biological surveys, endangered and threatened species, biophysical relationships, biological data management and impact analysis of proposed land use activities. The Natural Biological Diversity Database is the clearinghouse for such information on rare animals and plants in the state (<http://dep.state.ct.us/cgnhs/nddb/nddb2.htm>).

Bureau of Natural Resources, Inland Fisheries Division Programs

Fisheries Management Plans

The Inland Fisheries Division has completed fisheries management plans for bass and trout in inland Connecticut waters and actively manages for northern pike, walleye and kokanee salmon (<http://dep.state.ct.us/burnatr/fishing/geninfo/fishplan.htm>).

Inland Fisheries staff have collected data on fish populations in 86 lakes and 15 Connecticut River sites in the first general fisheries survey of Connecticut lakes and ponds since the 1950s. This survey provides up-to-date information on the fish populations inhabiting these waters, enabling the Inland Fisheries Division to make informed management decisions. These data will be used to develop a statewide Fishery Management Plan for largemouth and smallmouth bass. Largemouth and smallmouth bass are Connecticut's most popular warmwater gamefish (> 1.3 million fishing trips per year). They are also the principal predators in most of the State's lakes and ponds and thus play an important role in determining community structure. Information on both predator and prey populations are needed to effectively manage these fisheries.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

A comprehensive survey of the streams and rivers of the State of Connecticut began in 1988. Such a survey has not been done since the 1930's. Data on stream habitat, invertebrate populations, fish populations and angler use have been collected. The Inland Fisheries Division is using these data to develop a trout stocking formula which optimizes the allocation of hatchery fish and to develop a statewide trout management plan. In addition, this database provides the information necessary for timely and accurate completion of environmental reviews and will quantify the state's coldwater and warmwater stream resources. A publication that provides information on fish populations, trout stocking, angler access, and stream conditions will be produced for sale to the public.

Management of northern pike in Connecticut waters is accomplished through enhancement of the pike's natural reproduction in managed spawning marshes, and by stocking the fingerlings which are produced. A management plan is being prepared to ensure that the most cost efficient method of producing fingerlings is being used. An evaluation of the opportunities and needs for additional pike fisheries will be addressed.

The Division plans to create walleyes fisheries in three lakes that will generate more than 16,000 angler hours per year. Future management of walleyes will be evaluated based on the popularity of the sport fisheries that are created and an assessment of the impacts to other fish populations.

Kokanee salmon have supported fisheries for more than fifty years in Connecticut. Each autumn, adult kokanee are trap-netted from East Twin Lake and Lake Wononscopomuc, and transported to the Burlington State Trout Hatchery for spawning. There, the eggs are incubated and resulting fry reared until late May. They are then stocked in East Twin Lake, Lake Wononscopomuc, and West Hill Pond. Within three summers, the fry grow into adult salmon 12 - 16 inches long. Burlington Trout Hatchery produces all of the 150,000 kokanee salmon fry distributed in the state. This cost-effective management effort has created unique fisheries at East Twin Lake, Lake Wononscopomuc and West Hill Pond. It is estimated that our present kokanee management program can provide approximately 20,000 - 30,000 hours of recreational fishing each year.

Connecticut Aquatic Resources Education (CARE) Program

Division staff in the Connecticut Aquatic Resources Education (CARE) program has taught over 33,000 citizens about water, fish and fishing since 1986. The program is comprised of free classes and outdoor workshops that foster resource stewardship, promote an understanding of aquatic systems and fishery management decisions and encourage both an understanding and utilization of aquatic resources (<http://dep.state.ct.us/burnatr/fishing/care/care.htm>). Over 300 Instructors have contributed their time to the program at a rate equivalent to 15 full-time employees. *City Fishing* summer events have reached 4,000 minority youth on urban waters. The CARE curriculum is included in the classrooms of seven school systems. Educational efforts at two Inland Fisheries Division

hatcheries and a CARE education center reach 10,000 citizens annually. Plus, CARE staff has developed displays already viewed by 5 million citizens.

Hatcheries and Fish Culture Programs

The goal of this Inland Fisheries Division program is to improve the efficiency and effectiveness of fish culture and fish management operations in Connecticut (<http://dep.state.ct.us/burnatr/fishing/geninfo/fisherie.htm>). Staff is involved in the diagnosis and cure of fish health/environmental problems in public fish cultural facilities, as well as fish health problems in wild populations within the state. The State Fish Pathologist undertakes annual inspections and/or monitoring of state hatchery and natural fish populations for bacterial and viral pathogens and fish parasites and assists in alleviating problems by recommending treatments. Outreach efforts are underway, or being developed, to fully extend the services of this program to private fish culture facilities.

The Kensington Atlantic Salmon Hatchery's planned annual production is 3,000,000 Atlantic salmon eggs and 800,000-900,000 Atlantic salmon fry. A total of 1,500,000 of these eggs are distributed to hatcheries operated by other states and the Federal government, and constitute a portion of DEP's support for the overall Connecticut River Atlantic Salmon Restoration Program. Kensington Hatchery releases surplus brood stock Atlantic salmon into the Naugatuck River and Shetucket River, providing an estimated 10,000 hours of recreational fishing each year.

Through the Catchable Trout Program, the Inland Fisheries Division produces approximately 800,000 catchable sized (6"-12") brook, brown and rainbow trout and 1,300-2,000 surplus brood stock (3-13lbs) each year for distribution into the waters of the state. All waters open to public fishing and suitable for trout are stocked and without stocked trout there would be little trout fishing in Connecticut. The numbers of fish stocked in each location depends on total trout production, area open to the public, habitat quality and fishing pressure. It is estimated that the present trout program provides approximately 1.9 million days of recreational fishing each year or approximately fifty-six percent (56%) of all the freshwater fishing in Connecticut.

The Inland Fisheries Division also has produced between 45,000 and 167,000 juvenile, "management sized" (1"-6"), trout each year to support Federal or State funded research projects, special management programs (such as the eight Trout Management Areas, located on rivers around the state, and trophy trout lakes) and for distribution into the public waters of the state.

Lastly, the Bureau of Natural Resources, Inland Fisheries Division has produced between 250,000 and 650,000 eyed trout eggs that are surplus to the needs of our trout culture programs and can be made available to other fish culture operations. These eggs are sold to private commercial fish hatcheries and provide a disease free egg source for them and a small revenue back to the Conservation Fees

Fund.

Trout Management Areas

Connecticut has eight Trout Management Areas (TMAs) and one Wild Trout Management Area (WTMA; <http://dep.state.ct.us/burnatr/fishing/fishinfo/troutprk.htm>). These areas are all managed with variations of catch-and-release regulations and typically attract more angler days, sustain higher catch rates throughout the year, and are more cost effective (more angler hours per trout stocked) than areas managed under statewide trout regulations. Collectively they attract more than 100,000 angler hours per year. Monitoring provides the information necessary to evaluate the success of three TMAs and one WTMA. This information is needed to respond to sunset clauses in the regulations. Periodic monitoring of all TMAs enables the Division to determine if objectives are being met and to respond to angler inquiries and requests.

Habitat Conservation and Enhancement (HCE) Group

The Habitat Conservation and Enhancement Group serves as a vital liaison between the Inland Fisheries Division and DEP Water Management and Office of Long Island Sound Programs personnel who take primary responsibility in regulating permitted activities which potentially impact fish populations (<http://dep.state.ct.us/burnatr/fishing/geninfo/fisherie.htm>). HCE staff interacts directly with federal, state and local regulatory and planning agencies, as well as private conservation organizations, to provide timely information to conserve, restore and enhance the state's aquatic environments. Staff also provides site-specific guidance to private landowners managing freshwater and marine systems throughout the state. On average, each year the five HCE staff people review over 250 regulatory permits, design or facilitate the restoration of 10-15 degraded stream reaches and tidal areas and initiate or facilitate 10-20 stream or pond enhancement projects. Staff annually provides technical guidance on fisheries management to more than 250 private citizens, managing over 200 ponds and 50 miles of stream resources, and reviews over 500 applications for the use of aquatic herbicides. Recently project staff responsibilities were expanded to include implementation of the legislatively mandated triploid grass carp importation and liberation program in Connecticut. This program requires the review and site inspection of more than 125 permit applications annually in order to ensure that this introduced fish species does not cause irreparable habitat damage.

Anadromous Fisheries Assessment and Restoration Program

The Inland Fisheries Division is actively involved in the protection and enhancement of anadromous fish runs and collaborates with the U.S. Fish and Wildlife Service (Section 4.6), the Connecticut River Watershed Council (Section 4.8) and others to restore anadromous fish runs in the state's watersheds (<http://dep.state.ct.us/burnatr/fishing/geninfo/fisherie.htm>). Anadromous fish play an

important ecological role as they transfer energy between freshwater, estuarine and marine ecosystems, and many of these species (particularly river herring), are popular bait for recreational anglers pursuing predatory marine gamefish. In Connecticut, as elsewhere in New England, the numeric size of anadromous fish runs have all been diminished due to human impact on watercourses over the past 300 years.

In order to protect the remaining runs, or restore lost runs, Division staff is actively involved in the construction and operation of fishways at state-owned dams and also provide technical assistance for fishway construction at privately owned dams. Technical assistance is also provided to DEP Bureau of Water Management and DEP Office of Long Island Sound Programs staff on how to best protect runs in watercourses subject to dredging, filling, bridge construction or demolition, or other in-water perturbations. Division staff monitors the harvest of anadromous fish in state waters in order to promulgate regulations, which ensure stock health and wise use.

The Inland Fisheries Division also conducts research on shortnose sturgeon and American shad in Connecticut. To aid in the protection of the state's only endangered fish species (both State and Federal listing), Inland Fisheries Division staff collects information on numbers, locations, movements and behavior of Connecticut River shortnose sturgeon. Several concentration areas in the river were identified where sturgeon congregate year-round. Seasonal movements of fish between concentration areas were precisely mapped.

Because of the popularity of American shad with recreational anglers and importance to the river's commercial fishery, Connecticut River basin states have committed to fully restore the river's American shad population to two million fish at the river mouth, and provide passage for 50% of the population arriving at the base of each mainstem dam. To facilitate that effort, Fisheries Division staff has monitored adult American shad in the Connecticut River since 1974, and juvenile shad abundance and distribution since 1978.

Bureau of Natural Resources, Marine Fisheries Division Programs

Fisheries Management Plans

Every commercially and recreationally important marine fish stock in Long Island Sound is fished in more than one state, and most in federal waters as well. In order to coordinate effective management programs, Marine Fisheries Division staff are active members of two marine fishery management organizations intended to coordinate cooperative, interjurisdictional (interstate, state/federal) resource management activities: The Atlantic States Marine Fisheries Commission and the New England Fishery Management Council.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The Atlantic States Marine Fisheries Commission (ASMFC) is an interstate compact authorized by Congress "to promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries." The Commission is responsible for preparation of fishery management plans for migratory or shared fishery resources, which occur predominantly in states' waters. Examples of species managed include striped bass (<http://dep.state.ct.us/burnatr/fishing/marineinfo/stbplan.htm>), bluefish, summer flounder, winter flounder, weakfish, and shad.

The New England Fishery Management Council is one of eight regional councils established by Congress to develop management plans for fishery resources occurring predominantly in the U. S. Exclusive Economic Zone (the "200 mile limit"). Connecticut is one of five member states of the New England Council, a body comprised of government officials, and persons knowledgeable about the fisheries who are appointed by the Secretary of Commerce from lists submitted by the Governors of the New England coastal states.

The principal species being managed under New England Council plans are the multi-species groundfish complex (cod, haddock, yellowtail flounder, winter flounder, pollock, whiting, and others), sea scallops, and American lobster, while a monkfish plan is under development. Connecticut is also involved with the Mid-Atlantic Fishery Management Council, which is responsible for development of plans for southern-ranging species (summer flounder, scup, squid). There are a number of species for which jointly prepared plans have been developed between Councils and the ASMFC, notably summer flounder and bluefish.

Fisheries Statistics and Assessment Programs

The Marine Fisheries Division maintains several fisheries statistics and assessment programs (<http://dep.state.ct.us/burnatr/fishing/geninfo/fisherie.htm>). These programs include the Marine Resource Survey, the Marine Recreational Fisheries Statistics Survey, a commercial fisheries statistics program, an Inland Marine Survey, an American Lobster Assessment Program, and multidisciplinary survey and assessment activities in support of other DEP projects (e.g., hypoxia in Long Island Sound).

The Marine Resource Survey is a vital tool, which Fisheries staff uses to measure the abundance and distribution of important finfish, squid, and crustaceans (lobster, crabs) in Long Island Sound, independent of the current fishery. By comparing Survey data with current fishery data (landings, catch/effort, seasonal patterns) Marine Fisheries staff can weigh each species' harvest against its abundance on an annual basis, and measure the production of young fish entering into the adult population, which is fished. This information allows staff to develop effective management strategies to maintain and enhance the Sound's fish populations.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Fisheries Division staff has been collecting marine recreational fisheries statistics in Connecticut since 1979 and, in 1987, joined the National Marine Fisheries Service's (NMFS) coast-wide survey in order to improve the data collection. On average, 350,000 marine anglers make about 1.4 million fishing trips yearly in Connecticut, with a recent total harvest of 2-4 million fish.

Management of commercial fisheries, which range coast-wide, require comprehensive and timely monitoring for effective management. Twenty years ago, Connecticut was the first New England state to develop a comprehensive "Marine Fisheries Information System," a computerized, integrated database of commercial fishery licensing data and catch statistics, to meet this need.

Since 1990 the Division has conducted a Seine Survey to monitor winter flounder, the most heavily harvested fish in Connecticut, and other bottom fish.

The Division also conducts an American Lobster Assessment Program to provide information necessary to maintain a fishery in Long Island Sound with large, stable landings, which does not remove so many mature lobsters that the resource is jeopardized. In addition, since 1987 Marine Fisheries staff has been actively involved in identifying the impacts of hypoxia on living resources in the Sound.

In 1984, the Marine Fisheries Division completed a Marine Resources Management Plan for the State of Connecticut, identifying three priorities, state policies to meet those priorities, and a series of objectives to implement the policies. The three priorities of the plan are to protect the state's marine resources from inappropriate use and abuse, manage the marine resources as a public food source, and enhance recreational and commercial fishing opportunities in Long Island Sound. The conservation recommendations and priorities identified in this plan have been incorporated into this CWCS plan.

Local Government Coordination

Resource Management by municipalities is exercised exclusively over shellfish in beds under town jurisdiction with the exception the town waters of West Haven, New Haven, Milford, and Westport (CGS Sec. 26-238 and 26-257). Shellfish resources in the waters of these cities and towns are managed by the Aquaculture Division of the Department of Agriculture. Management by the towns is through appointed shellfish commissions empowered to enact regulations on seasons, quantities to be taken, minimum sizes of shellfish and the methods of harvest. In this manner, local control is exercised over local resources.

The process for enacting or amending town shellfish regulations varies among communities. Generally, proposals may be made by the town shellfish commission, or to the commission by interested citizens. Also, most commissions retain shellfish wardens who have law enforcement responsibilities. These individuals often become the most knowledgeable persons regarding the status of the

town's resources and the activities of their users. As a result, proposals many times emanate from the shellfish wardens. After due process, which includes review and public hearing, regulations are enacted for the coming fishing season. Generally, the process is repeated each year.

Bureau of Natural Resources, Forestry Division Programs

In Connecticut, the Division of Forestry is responsible for the management of nearly 150,000 acres of state-owned forestland, located within the 32 State Forests. The Division is also responsible for the certification of the various forest practitioners in the state, for approving the status of land that is taxed as forestland, for overseeing the health of the state's forestlands, for assessing the potential for wildfires, for initiating urban forestry programs and for outreach to the owners of private forestlands (<http://dep.state.ct.us/burnatr/forestry/index.htm>).

The Division of Forestry has responsibility for administering the Forest Practices Act including a certification program for forest product professionals (<http://dep.state.ct.us/burnatr/forestry/boutfrst.htm#Act>).

State Forest Plans

The Division of Forestry has just completed the Connecticut Statewide Forest Resource Plan. This plan identifies priorities and issues regarding the State's forests, and provides public and private sectors as well as citizens an update on current forest conditions and threats affecting the forest resources as well as recommendations on how to address them. This plan was developed through a participatory process that incorporated stakeholder input and its results have been incorporated into this CWCS plan.

Currently, there are 32 State Forests in the Connecticut State Forest system. In managing these lands, the Division of Forestry seeks to develop a vigorous, resilient forest environment capable of sustaining the wide range of demands that the public places on these lands. The Division's professional Foresters work to insure that these forests remain healthy and vigorous while serving the needs of the citizens of Connecticut.

The Forestry Division provides stewardship for Connecticut's forest resources by preparing comprehensive plans for the management of DEP-controlled forest resources to enhance forest health and vigor while maximizing the values of the forest for various uses such as wildlife, water quality, recreation, aesthetics, and forest products. The Division provides active silvicultural management of DEP-controlled forest resources in conformance with forest management plans and use the State Forests as demonstration sites for forest stewardship education programs.

Forest Land Enhancement Program

The Forestry Division promotes the use of sustainable forest management practices on non—industrial private forestlands. The program provides education, management expertise and financial assistance to these landowners that complements other existing state and federal forest assistance programs. The Forest Land Enhancement Program has drafted a Connecticut State Priority Plan that outlines the rules and procedures for implementing the program. In addition to education and research, the goals of this plan include fostering forest ecosystem health, stewardship of public and private forests, recreational use of the state's forests, and a sustainable forest-based economy. The goals of the Forest Land Enhancement Program State Priority Plan have been incorporated into this CWCS plan where appropriate.

Private Landowner Assistance

The Division of Forestry Service Foresters provides technical advice and assistance to owners of forestland throughout the state. This service is available to private citizens, municipalities, conservation groups or other private or public organizations. The Foresters also offer landowner assistance by providing tree injury diagnosis for private forest landowners and recommendations for control of causal insects or disease, in close cooperation with the Connecticut Agricultural Experiment Station and with the University of Connecticut Cooperative Extension Service (Section 4.2).

Urban and Community Forestry

The Division of Forestry's Urban Forest program promotes the sound management of urban and community green resources and assists municipalities, and the general public, and administers a small urban forestry grants program for municipalities and non-profit organizations. The Urban and Community Forestry program offers technical assistance to local governments in the inventory and management of both urban forest resources and undeveloped publicly owned forested lands (<http://dep.state.ct.us/burnatr/forestry/urbanforest/urbanfor.htm>). The program provides leadership to the Connecticut urban forestry professional community through the Connecticut Urban Forest Council. The Division also provides financial assistance to local communities in urban forest management projects and in tree planting projects via the federally-funded "America the Beautiful" and "Small Business Assistance Tree Planting" programs that are administered by the Division. Forestry Division staff promotes "grass roots" involvement in community planting and tree care projects through a Volunteerism Program (coordinated by the University of Connecticut Cooperative Extension Service (Section 4.2) and funded through the Division of Forestry.)

Connecticut State Nursery

The Forestry Division maintained a state forest nursery until February 2004, when the nursery was transferred to private management with the Natural Attractions Project, Inc. (www.napinc.org). The Pachaug State Forest Nursery manages a "seed orchard" for genetically superior tree seed production to supply the state nursery; conducts a sales program of a variety of seedlings, encouraging planting to diversify the species composition of Connecticut's forests; and provides seedling stocks for seedling sales programs in the states of Rhode Island and Massachusetts in exchange for minor federal financial support (<http://dep.state.ct.us/burnatr/forestry/nursery/nursery.htm>). The nursery program also provides administrative support and technical assistance for several federal cost-sharing programs (i.e., Agricultural Conservation Program, Conservation Reserve Program, and Stewardship Incentives Program) which provide landowners with funding incentives to perform needed non-commercial silvicultural practices.

Forest Fire Prevention and Control

The Division of Forestry maintains an active forest fire prevention program and a specially-trained force of fire fighting personnel to combat fires on an average of 2,000 acres of forestland per year. The Forest Fire Prevention and Control program coordinates the Select Committee on Forest Fire Control analysis of the state-wide system of forest fire control and assists in preparation of the committee's recommendations, maintains a fully trained and equipped crew of fire fighters "on call" for assistance both in-state and to the federal government in fighting fires in the western U.S., and coordinates the timely suppression of all forest fires in the state, using trained DEP personnel, trained Fire Warden personnel, local fire departments, and the Connecticut National Guard (<http://dep.state.ct.us/burnatr/forestry/boutfrst.htm#Fire>). Staff also conducts a forest fire prevention program utilizing Smokey Bear as a focus. In addition, the program administers the federally-funded Rural Community Fire Protection program, "passing through" federal funds for equipment and training to fire departments which serve small communities in the state. The Division participates in the Northeastern Interstate Forest Fire Protection Commission (see CGS Chapter 450) to coordinate mutual aid in fire prevention and suppression efforts among the Northeastern state and adjacent Canadian provinces. Daily forest fire danger reports are distributed on-line to the public at <http://dep.state.ct.us/updates/forestf/firerpt.asp>.

Forestry Legacy Program

The Forestry Division administers the federal Forest Legacy Program in Connecticut, in cooperation with the Connecticut Dept. of Agriculture, to acquire development rights to lands possessing qualities important to the maintenance of forest ecological values within specific critical areas of the state.

Forest Stewardship Education

In addition to the above forest resources stewardship and protection programs, the Forestry Division also includes a Forest Stewardship Education program that promotes general public awareness and understanding of, and support for sound forest stewardship principles, and enhances technical skills in forestry professionals through the Stewardship Program, in cooperation with the UConn Cooperative Extension System. This education program provides educational outreach in the areas of urban trees (Arbor Day), tree and forest concepts (Project Learning Tree), and forest ecology, in cooperation with the Department's Goodwin State Forest Conservation Center and the Connecticut Forest and Park Association. Division staff assists in conducting certification inspections of Tree Farms and in the business of the Connecticut Tree Farm Committee of the American Tree Farm Program as well.

Office of Long Island Sound Program

The Office of Long Island Sound Programs (OLISP) coordinates programs within the Department of Environmental Protection that have an impact on Long Island Sound and related coastal land and water (<http://dep.state.ct.us/olisp/index.htm>). OLISP implements, oversees, and enforces the state's coastal management and coastal permit laws and regulations, manages programs to protect and restore coastal resources and habitat, and helps coastal towns to plan and implement programs to protect coastal resources and encourage water-dependent uses of the shorefront.

The Office implements Connecticut's federally-approved coastal zone management program pursuant to the federal Coastal Zone Management Act of 1972, as amended (CZMA). The Permitting and Enforcement section of OLISP is responsible for coastal permitting and enforcement actions pursuant to the state's various coastal regulatory authorities. Staff efforts include everything from pre-application guidance to post construction inspection, from investigation of complaints through enforcement resolution.

The Coastal Planning section of OLISP is responsible for coastal planning and policy analysis. Staff is responsible for municipal, state and federal coastal management consistency for all activities landward of the high tide line, and coordinate closely with coastal permit staff in the review of those activities, which are, in whole or in part, below the high tide line. Staff is assigned to specific coastal communities and serves as liaisons between these municipalities and other DEP units, since many coastal projects and issues involve multiple permits and reviews.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Finally, the Technical Services section is responsible for providing the technical expertise for the Office's resource management efforts. This section works closely, not only with the other OLISP sections, but also with the technical experts throughout the agency to ensure an interdisciplinary approach to coastal resource and ecosystem management. Specific responsibilities include the following:

- Plan, design and implement restoration of coastal habitats
- Administer the Department's Long Island Sound Research Program and Fund
- Provide technical assistance with respect to coastal resource impact assessments and restoration plans
- Develop new and update existing spatial data for the coastal area to support the Department's overall geographic information system and data management initiatives (<http://dep.state.ct.us/olisp/pubs.htm>)
- Coordinate with state and federal resource experts in the development and implementation of coastal resource programs and specific efforts
- Conduct special coastal resource management planning studies of a technical or scientific nature

The OLISP is funded through the State of Connecticut and the National Oceanic and Atmospheric Administration. Section 4.6 provides additional information on the Long Island Sound Study, which is coordinated by the Environmental Protection Agency. The OLISP is currently drafting a Coastal and Estuarine Land Conservation Plan (CELCP) with the goal of identifying priority land conservation needs along Connecticut's coast; the planning process is similar to this CWCS plan but with the specific objective of identifying priority lands for land acquisition.

Environmental and Geographic Information Center (EGIC)

Connecticut's environmental, economic and land-use decisions require fundamental information about the state's environment and natural resources, and the conditions and processes that influence those resources. With such information, decisions are less likely to be adversely affected by resource settings or conditions and negative impacts to the environment will be minimized. The objective of the Environmental and Geographic Information Center (EGIC) is to research and acquire natural resource information, to develop resource management techniques, and to implement data retrieval and delivery systems needed to make informed decision about the state's land, air, and water systems.

The Environmental and Geographic Information Center accomplishes its mission through programs that focus on natural resource inventory, monitoring and research of the state's land surface, earth materials, water resources, biota, and climate; by identifying and

explaining the interrelationships and processes among resources; by meeting the state's and public's need for natural resource information through publications and automated systems; by promoting and conducting scientific study of natural resources; and by providing technical support and management strategies for environmental, water and land-use decisions. The Connecticut Geological and Natural History Survey has been the primary mechanism for collecting and distributing earth science and biological diversity data. As part of a recent Department reorganization, the Geological and natural History Survey was shifted from EGIC. The Earth Science Section remains with EGIC and continues to work closely with the Geospatial Information Section. The Biological Science Section has been moved to the BNR Wildlife Division to more closely integrate rare plant and animal information gathering with management activities.

Connecticut Geological Survey

The Connecticut Geological Survey is responsible for the coordination and implementation of statewide natural resource data collection inventories in the following areas: surficial and bedrock geology, land cover, remote sensing; monitoring networks for quantity and quality of surface and groundwater, and climate.

The Earth Science Section develops and implements earth science related basic data collections, analysis, and interpretation activities, in order to ensure the availability of scientific, economic, and educational information in the fields of environmental hazard geology, aerial photography, topographic mapping, terrestrial and marine geology, and soils. In addition, the Geologic and Natural History Survey develops and coordinates cooperative surveys to better understand and map the physical characteristics of the Long Island Sound basin.

The Resource Inventory and Mapping Section provides Global Positioning Survey (GPS) mapping services to the Biological and Geological Sections of the Connecticut Geological and Natural History Survey. This section also provides GPS mapping services to units within the Department of Environmental Protection's Conservation Branch, including Boating, Parks, Forestry, Fisheries, Greenways, and Natural Areas.

Geospatial Information Section

The EGIC develops and maintains a statewide automated geospatial data storage and retrieval system that can rapidly integrate and analyze large amounts of spatial and tabular data over any selected geographic area in support of department planning, management and regulatory needs (<http://dep.state.ct.us/gis/index.htm>). This section assists in developing program spatial data analysis applications and provides technical support to the agency.

Technical Publications Section

The Technical Publications Section provides publication services to the agency with special emphasis on the manuscripts of the State Geological and Natural History Survey and makes available natural resource and environmental maps and documents through the operation of a publications sales outlet (the DEP Store, <http://dep.state.ct.us/store/index.htm>) and a lending library.

Other State Programs

Each of these state partners were informed of the SWG effort and input was requested as was review of the draft CWCS on the website. In some cases, coordination meetings were used for outreach, and for others, letters, phone calls and/ or email contact was made.

Connecticut Department of Agriculture

The mission of the Department of Agriculture is to foster a healthy economic, environmental and social climate for agriculture by developing, promoting and regulating agricultural businesses; protecting agricultural and aquacultural resources; enforcing laws pertaining to domestic animals; and promoting an understanding among the state's citizens of the diversity of Connecticut agriculture, its cultural heritage and its contribution to the state's economy.

Shellfish and Aquaculture Programs

The Department of Agriculture, Bureau of Aquaculture (DA/BA) responsibilities include leasing submerged State lands for shellfish operations including aquaculture, classifying shellfishing waters, monitoring water quality, identifying sources of pollution, seeking corrective actions, and licensing of all commercial shellfish operations (<http://www.ct.gov/doag/cwp/view.asp?a=1369&Q=259170#PROGRAM>). These operations also include scientific studies, as well as commercial seed oyster harvesting. DA/BA is also involved in seed oyster enhancement activities through its cultch program and licenses conch (whelk) fishing. The enforcement of laws relating to illegal harvesting is handled by the Department of Environmental Protection, Law Enforcement Division working cooperatively with municipal enforcement officials.

The Department chairs an interagency planning and steering committee on aquaculture, which includes the Departments of Environmental Protection, Consumer Protection and Economic Development. The committee is developing a comprehensive strategy for the planned development of aquaculture in Connecticut. The strategy will address regulatory issues, marketing opportunities, disease control, aquaculture for natural stock enhancement and financial assistance programs for aquaculturists.

Animal Population Control Program

<http://www.ct.gov/doag/cwp/view.asp?a=1367&q=259104>

The Animal Population Control Program (APCP) was created by law in 1992 and implemented on May 22, 1995, to provide sterilization and vaccination benefits for any unsterilized dog or cat adopted from a municipal impound facility in Connecticut. Program goals are to reduce pet overpopulation, reduce the spread of rabies and other diseases through immunizations and subsequently increase the effectiveness of local Animal Control Departments through education and law enforcement.

Animal Control Division

<http://www.ct.gov/doag/cwp/view.asp?a=1367&q=259098>

The Animal Control Division is responsible for the investigation of injury, property damage and nuisance caused by dogs. The Bureau staff works with state and local authorities in dealing with rabid and suspect rabid animals, verify rabies vaccination status for dogs and cats, and provide transportation and handling of specimens for testing. Dog damage claims are investigated and appraised. Training and counseling is provided for municipal animal control officers and local officials are assisted in dog licensing procedures. Investigations of dog related incidents, including, but not limited to, cruelty to animals, nuisance, roaming and licensing violations are part of this division's responsibility.

Environmental Assistance Program

<http://www.ct.gov/doag/cwp/view.asp?a=1368&q=270138>

Connecticut is able to offer technical and financial support to farm businesses in their farm waste efforts through the "Partnership for Assistance on Agricultural Waste Management Systems" (the "Partnership"). This partnership consists of the following cooperators:

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

USDA Natural Resources Conservation Service (NRCS), USDA Farm Service Agency, University of Connecticut Cooperative Extension System, Connecticut Conservation Districts, the Connecticut Department of Environmental Protection and the Connecticut Department of Agriculture.

In cooperation with the "Partnership", the USDA Environmental Quality Incentive Program (EQIP) provides cost sharing for agricultural improvements that will help meet water quality and other environmental objectives (Section 4.6). Based on state priorities, EQIP offers 5 to 10 year contracts that provide incentive payments and cost sharing for conservation practices.

Another source of financing within the "Partnership" is available through the Connecticut Department of Agriculture's Environmental Assistance Program (EAP) for Connecticut farmers. This program allows for the Connecticut Commissioner of Agriculture to reimburse any farmer for part of the costs that qualify under the EAP in order to maintain compliance with Connecticut Department of Environmental Protection approved agricultural waste management plan.

Farmland Preservation Program

The Department of Agriculture preserves farmland by acquiring development rights to agricultural properties (<http://www.ct.gov/doag/cwp/view.asp?a=1368&q=259136>). The farms remain in private ownership and continue to pay local property taxes. A permanent restriction on nonagricultural uses is placed on these properties. Nationally, farmland preservation has been recognized in the federal Farm Bill and Connecticut's Farmland Preservation has qualified for participation in the federal Farmland Protection Program.

The main objective of the farmland preservation program is to secure a food and fiber producing land resource base, consisting primarily of prime and important farmland soils, for the future of agriculture in Connecticut. A goal of preserving 130,000 acres, with 85,000 acres of cropland continues to be in effect for the Department of Agriculture. So far, 22% of this 130,000-acre goal has been met through the purchase of development rights program.

CT Department of Transportation, Division of Intermodal and Environmental Planning

Coordination with the state program that prepares and evaluates highway location plans and layouts was important. This division conducts special highway feasibility studies and major investment studies; conducts transit planning studies and evaluates transit alternatives for inclusion in feasibility and environmental studies; administers the expansion and maintenance of the Department's commuter parking lot program; plans and coordinates port, rail freight and ferry studies; plans and coordinates the development of

bicycle and pedestrian facilities; develops master plans for State-owned airports and conducts other aviation planning activities; processes requests by the public for the sale of excess State property.

Connecticut Office of Policy and Management

The Connecticut Office of Policy Management (OPM) is within the Governor's office and formulates public policy goals for the state (<http://www.opm.state.ct.us>). The OPM prepares a *Conservation and Development Policies Plan for Connecticut* to guide state policies and programs every five years. The most recent plan covers the period from 1998 to 2003 and provides a blueprint for conservation, development and environmental protection in the state (CT OPM 1998, 2005). The plan identifies conservation needs and goals and outlines solutions to address each, similar to this CWCS process except with a broader scope. Policy recommendations are delineated in the plan for transportation, water supply and quality, food production (agricultural and fisheries), solid waste management, air quality, and natural and cultural resources. The goal of the latter is "to enhance the quality of the physical, cultural, and biological environment by conserving and preserving natural and cultural resources and ecological systems". Specific policy recommendations include protecting and improving the water quality and aquatic resources of Long Island Sound and the state's river systems, identifying and protecting "critical environmental areas of the state," and the preservation of open space (CT OPM 1998, 2005). The conservation recommendations of the *Conservation and Development Policies Plan for Connecticut* have been incorporated throughout this CWCS plan.

The Connecticut Open Space Initiative (Green Plan)

The Connecticut Open Space Initiative originated in 1998 as a result of collaboration between the Governor, the Connecticut General Assembly, the Blue Ribbon Task Force on Open Space, and the CT DEP. In 2001, the CT DEP published a Green Plan outlining achievements of the Open Space Initiative to date and a strategy for conserving at least 21% of the state's land area as open space by 2023. Connecticut's Open Space Protection Program, located within the DEP Division of Land Acquisition and Management, provides a diverse landscape that offers outdoor recreation, protects water supplies, preserves fragile natural communities and habitats for plants and animals, offers green spaces accessible to city residents, and maintains a working natural landscape for the harvest of farm and forest products. The goal of the program is "to have at least 10% of Connecticut's land area held by the state as open space for the beneficial use and enjoyment of the public as additions to the State's system of parks, forests, wildlife, fisheries and natural resource management areas; and to have a total of 21% of the state's land preserved as open space by the year 2023 in state, municipal, private nonprofit, water utility and federal ownership" (*Connecticut General Statutes Section 23-8(b)*).

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

In the first three years of the program (1998-2001), \$103.5 million were allocated via the Recreation and Natural Heritage Trust Fund, the Open Space and Watershed Land Acquisition Grant Program, and the Charter Oak Open Space Trust to purchase additional state lands and provide matching funds for municipalities, nonprofit land conservation organizations, and water utility companies to purchase open space lands. As of 2001, 68% of the state-owned targeted acreage (217,000 of 320,576 acres) had been met and 65% of the non-state owned acreage target (227,740 of 352,634 acres) had been reached. The program continues to make significant progress towards its 2023 goals, focusing on lands that protect water access sites, natural areas, greenways, scenic and historically significant properties, forests, habitat for native plant or animal species listed as threatened, endangered, or of special concern, Class I or Class II watershed and areas that protect water quality, and sites in urban areas and that preserve local agricultural heritage.

University of Connecticut Programs

The University of Connecticut (UConn) has several programs and projects focusing on Connecticut's landscape, flora and fauna, and their management. The majority of these programs have partnerships with CT DEP, federal natural resource agencies, municipalities, and non-governmental organizations.

Many of these programs are housed under UConn's Center for Land use Education And Research (CLEAR), which has both education and training programs and landscape research programs (<http://clear.uconn.edu>). One such landscape research program is the Laboratory for Earth Resources Information Systems (LERIS), a remote sensing and geospatial analysis program that studies ecology and the environment, land use and land cover in Connecticut (<http://www.resac.uconn.edu/leris/>); LERIS has been recognized as a Center of Excellence by the National Aeronautics and Space Administration (NASA). In addition, NASA established a Regional Earth Resource Applications Center, locally named NAUTILUS (Northeast Access to Useable Technology in Land Planning for Urban Sprawl) within CLEAR to survey urban sprawl and management in the state. The Connecticut's Changing Landscape Project allows UConn and its partners to educate local, state and federal managers (and the public) about land use patterns trends that affect the state's natural resources (<http://clear.uconn.edu/projects/landscape/index.htm>).

The CLEAR at UConn also has natural resource programs that provide technical information and assistance to municipalities, nonprofit organizations and the public. The Nonpoint Education for Municipal Officials (NEMO) program was initiated in Connecticut but has since spread to several other states. NEMO educates local land use managers on the impacts of land use decisions on the state's natural resources (<http://nemo.uconn.edu/>). The Forest Stewardship Program and the Urban and Community Forestry Program, operated in conjunction with the UConn Cooperative Extension Service, CT DEP (Section 4.1), and the U.S. Forest Service (Section 4.6), provide technical assistance to private forest landowners and municipalities on the sustainable management of forest habitats (<http://www.camr.uconn.edu/ces/forest/>). Working with the Ruffed Grouse Society (Section 4.8), the Forest

Stewardship Program also has a Coverts Program to enhance, restore and preserve woodland habitat for ruffed grouse, woodcock and other game species. Finally, CLEAR includes the Green Valley Institute, which partners with Quinebaug and Shetucket Heritage Corridor, Inc. (Section 4.4) to provide the public and local planners with natural resource information on which to base land use decisions.

In addition to CLEAR, UCONN has several other programs that support the conservation of fish and wildlife resources in Connecticut. The Cooperative Extension Service, supported by the U.S. Department of Agriculture (Section 4.6), offers localized expertise to landowners and the public on animal health and agriculture, nutrition, plant horticulture and gardening, natural resources, land use and the environment (<http://www.canr.uconn.edu/ces/>). The Connecticut Sea Grant is a partnership between UCONN and the National Oceanic and Atmospheric Administration (Section 4.6) that is dedicated to environmental education, natural resource management and scientific research on the aquatic resources and industries in Connecticut (<http://www.seagrant.uconn.edu/>).

The Wildlife Conservation Research Center is a privately funded program at UCONN that conducts scientific research on the ecological needs of wildlife, uses that research to foster educated stewardship of wildlife resources, and increases public knowledge of conservation principles, wildlife values and scientifically sound management practices (<http://www.canr.uconn.edu/nrme/programs/wildlife/wcrc/index.htm>); the center can perform contract ecological studies for state, federal and private entities. The UCONN Center for Conservation and Biodiversity is a partnership with the university, the Connecticut State Museum of Natural History, and the Geological and Natural History Survey of the Connecticut State Department of Environmental Protection (Section 4.1; <http://www.eeb.uconn.edu/bioconctr/>). This program provides scientific expertise on local, national and international issues of conservation and biodiversity and offers workshops on conservation biology to inform conservation professionals with the latest research on ecological resources. The Center for Conservation and Biology is currently compiling an Invasive Plant Atlas of New England (IPANE; <http://invasives.eeb.uconn.edu/ipane/>).

The University of Connecticut also supports the conservation of fish and wildlife by maintaining a vast Biological Collections program of modern and fossil plants and animals (<http://collections2.eeb.uconn.edu/collections/chp.html>) and the Map and Geographic Information Center (MAGIC), a public digital library of natural resources information and data (<http://magic.lib.uconn.edu/>).

Local Coordination: Municipal Programs and Plans

Municipalities are critically important in delivering local conservation. Municipalities were contacted and workshops were set up to coordinate with them, as piggybacked on the MCA BMP workshops. Local groups, such as the Soil and Water

Conservation Districts, Planning and Zoning Sections, Wetland Boards, and Conservation Commissions were important to this process and provided excellent input and feedback at workshops and through the survey or other correspondence.

There are 169 municipalities in Connecticut and they are organized through 15 regional Planning units. The local municipalities within Connecticut are responsible for making zoning, development and land use decisions. Coastal municipalities develop local coastal management plans, working with the CT DEP Office of Long Island Sound on their development and implementation. Some coastal municipalities administer leasing and regulation programs for shellfish beds within their jurisdictions. In addition to these individual programs and plans, many municipalities have joined forces in regional planning and protection efforts to conserve watersheds and valleys of importance. The CT DEP can provide technical and financial assistance to these efforts, often as a state partner in their development and implementation. A selection of municipal programs and plans that contribute to the conservation of fish and wildlife resources in Connecticut are summarized below.

Farmington Valley Biodiversity Project

The Farmington Valley Biodiversity Plan is an example of a multiple municipality approach to fish and wildlife conservation. The mission of this regional initiative is to research and preserve the biodiversity in the Farmington River Valley, and it is coordinated by the Farmington River Watershed Association and the Metropolitan Conservation Alliance (<http://www.frwa.org/programs/>). The project is a collaboration of the seven towns found in the Farmington Valley – Avon, Canton, East Granby, Farmington, Granby, Simsbury, and Suffield. The goal of the project is to establish a comprehensive and accurate biological inventory of the valley, which provides the seven municipalities a scientific basis for making decisions on open space acquisition, resource conservation and land use management.

The first phase of the project was to establish a Geographic Information System (GIS) database of the existing natural resource, land use planning and biological information. The second phase was to collect and analyze new biological information (the location, quality and quantity of key indicator species and habitats) through field research in the valley. The last phase of the project is to make the biological database available for community use and education, especially to the local municipalities as they develop new Plans of Conservation and Development. Using the outcomes and findings of the Farmington Valley Biodiversity Plan, community based education initiatives will be implemented to raise awareness of the importance of sustaining the biological resources of the Farmington River Valley and promoting better habitat stewardship that benefits both wildlife and people.

The Last Green Valley

The Quinebaug and Shetucket Rivers Valley in northeastern Connecticut and south-central Massachusetts is commonly referred to as the “Last Green Valley” along the Boston to Washington, D.C., metropolitan corridor. The rugged 1,085 valley and its surrounding hills are relatively undeveloped, with more than 70% of its land area farm and forestland. The U.S. Congress designated the Quinebaug-Shetucket Rivers Valley as a National Heritage Corridor in 1994 due to its unique natural character.

In 1999, the 35 municipalities (26 in Connecticut, 9 in Massachusetts) within the valley were incorporated into the National Heritage Corridor. The municipalities (and other partners) subsequently formed the Quinebaug-Shetucket Heritage Corridor, Inc. (QSHC), to pool resources and collaborate on the preservation of the corridor through a regional municipality project (<http://www.thelastgreenvalley.org>). This nonprofit organization includes non-municipal members (e.g., state and regional entities, the National Park Service (Section 4.6), Congressional delegations, individuals, businesses) and serves as the official management authority for the National Heritage Corridor. The roles of the QSHC are to be a catalyst for collaboration between local, state and federal government entities, a facilitator and educator to encourage others to protect the corridor’s resources, and as a project manager for specific projects or programs that further the mission of the QSHC. The QSHC also is a funding source for conservation projects within the corridor, with both a Partnership Program Grants Program and a Historic Preservation Grant Program.

Connecticut River Estuary Regional Planning Agency

The Connecticut River Estuary Regional Planning Agency (CRERPA) consists of the nine towns in the Connecticut River estuary region: Chester, Clinton, Deep River, Essex, Killingworth, Lyme, Old Lyme, Old Saybrook and Westbrook (<http://www.crerpa.org/>). This coalition provides a regional planning forum for shared interests and resources amongst the municipalities, allowing the towns to provide regional services to their citizens (e.g., mass transit, recycling, waste management). Planners with the CRERPA provide technical assistance to the towns, many of which do not employ town planners, as they face zoning and development decisions. The agency produces a public education show for the local cable television channel, and show topics have included the designation of the Lower Connecticut River as one of the Last Great Places on Earth by The Nature Conservancy, water pollution, and the impact of mall development.

Connecticut River Gateway Commission

The Connecticut River Gateway Commission was established by the Connecticut General Assembly in 1973 as a state-local compact to protect the Lower Connecticut River Valley (<http://www.crerpa.org/gateway.html>). The legislated mission of the Commission is to “preserve the unique scenic, ecological, scientific and historic values of the lower Connecticut River valley for the enjoyment of present and future generations of Connecticut citizens.” The Commission focuses its efforts within the Gateway Conservation Zone, which includes a 30-mile long area and 8 member towns that have views of the Connecticut River (Chester, Deep River, East Haddam, Essex, Haddam, Lyme, Old Lyme, Old Saybrook). The main goal of the Commission is to preserve the scenic beauty of the valley. To that end, they have protected over 1,000 acres of land through gifts, easements and fee simple acquisitions. The Commission also has regional zoning administration rights, and has enacted standards for building height, setbacks, allowable land uses, and impervious surface coverages for lands within its Conservation Zone.

Connecticut Association of Conservation and Inland Wetlands Commission

A coalition of municipalities in Connecticut formed the Connecticut Association of Conservation and Inland Wetlands Commission (CACIWC) in 1974 to serve as a source of information and education to municipal Commissioners and staff serving on local Conservation and Inland Wetland Commissions (<http://www.caciwc.org/>). The CACIWC also allows individual and organization members, but only municipality members are voting members. Municipal conservation commissions have the authority to inventory natural resources, develop drought and watershed management plans, make recommendations on proposed land use changes, and manage or supervise municipally-owned open space. The Inland Wetlands Commissions oversee the protection of inland wetlands and watercourses, issuing local permits similar to the federal wetlands permit program (see Section 4.6). The CACIWC has initiated efforts to protect open space and control invasive species as well and offers public outreach activities to educate citizens on the preservation and management of Connecticut's natural resources.

Federal Programs

The following key federal partners were contacted to inform and engage in the SWG effort. Coordination meetings were held with some partners to exchange program input and solicit input during each stage of the CWCS process. Other partners were contacted by letter, phone and /or email and their input and review was requested.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Several federal agencies have fish and wildlife conservation programs within the state of Connecticut. Many of these agencies regularly partner with the CT DEP to protect, restore and mitigate for impacts to the state's valuable fish and wildlife habitats. Some of the agencies offer grant programs for state, local and private conservation projects, while others have acquired land directly for conservation. The state also collaborates with some of these agencies on the scientific study and management of fish and wildlife resources and habitat.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) have several fish and wildlife conservation efforts in Connecticut. The National Wildlife Refuge System has established the Stewart B. McKinney National Wildlife Refuge (NWR) in Westbrook, protecting valuable coastal habitat. The Salt Meadow Unit of the Stewart B. McKinney NWR has preserved over 200 acres of coastal habitat near Westbrook, and the Falkner Island Unit near Guilford has preserved additional island and aquatic habitats in coastal Connecticut.

In 1991, the U.S. Congress established the Silvio O. Conte NWR within the Connecticut River watershed. After a thorough evaluation of the fish and wildlife conservation needs throughout the entire 7.2 million acre watershed (in four states), the USFWS identified 180,000 acres of "special focus areas" in need of protection (<http://www.fws.gov/r5spc/landprot.htm>). The state of Connecticut contains 28,330 acres of land targeted for acquisition by the USFWS to build the Silvio O. Conte NWR. Of these 28,330 acres, 11,235 acres are non-forested wetland, 15,495 acres are upland habitats (agricultural, riparian and forest), and 1,600 acres are small, scattered sites for the protection of endangered and rare species. Table 4.1 lists several of the high priority sites targeted for fish and wildlife conservation within Connecticut.

The ten largest high priority areas in the Connecticut River watershed identified by the USFWS for protection within the Silvio O. Conte National Wildlife Refuge.

<i>Special Focus Area</i>	<i>Size (acres)</i>
Meshomasic Highlands	20,000
Hamburg Cove/Eightmile River and East Branch	2,200
Great Island Marshes/Black Hall River/Lieutenant River	2,120
Salmon Cove	2,000
Windsor Meadows/Farmington River Mouth	1,550
Wangunk Meadows	1,155
Selden Creek	1,115

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Lord Cove	1,110
Salmon River including tributaries below dams	965
Round and Boggy Meadows/Mattabeset, Coginchaug Rivers/Wilcox Island	860

In addition to preserving land for the conservation of valuable fish and wildlife resources within Connecticut, the USFWS has provided several million dollars in grants for conservation projects in the state in recent years. These funds have come from the Coastal, Partners, and Landowner Incentive Programs, and recent accomplishments include the restoration of over 400 acres of saltmarsh, 500 acres of freshwater wetland, and 600 acres of grassland habitats throughout the state through the Partners Program. The USFWS is also a partner in the Long Island Sound Study, which identifies and funds the restoration of coastal and estuarine habitats in Connecticut and New York.

The management of federally listed species within Connecticut is coordinated by the New England Ecological Services Field Office in Concord, New Hampshire. The Southern New England-New York Bight Coastal Program in Charlestown, Rhode Island, collaborates with states and partners adjacent to Long Island Sound on habitat restoration projects, land conservation, and the identification of priority coastal habitats and threats to coastal and marine habitats (<http://www.fws.gov/r5nep/nep1.htm>). The Connecticut River Coordinator in the USFWS's Fisheries Program works to protect fish and wildlife habitats in Connecticut, focusing on the restoration of migratory fish to the Connecticut River basin (<http://www.fws.gov/r5crc/>). The USFWS also maintains a Law Enforcement Special Agent in Hartford to enforce existing federal fish and wildlife conservation laws and occasionally assist state law enforcement efforts.

U.S. Geological Survey

The U.S. Geological Survey (USGS) has several on-going natural resource programs and projects within Connecticut and Long Island Sound that contribute to the conservation of fish and wildlife resources. The Coastal and Marine Geology Program, regionally based out of Woods Hole, Massachusetts, created the Long Island Sound Environmental Studies Program in 1995 to coordinate scientific studies of the Sound, studying the geology, contaminants and environmental issues in particular (<http://woodshole.er.usgs.gov/project-pages/longislandsound/index.htm>). Collaborating with CT DEP and other partners, the USGS has completed benthic sedimentary environment mapping projects in or adjacent to Milford, Hammonasset Beach State Park, Norwalk Islands, New Haven Harbor, Niantic Bay, Falkner Island, Fishers Island Sound, and many other locations throughout the Sound (e.g., <http://pubs.usgs.gov/of/of00-304/index.htm>). These mapping projects can aid in the identification of priority areas for restoration and protection of aquatic resources; their contaminants and sediment transport studies can assist in the avoidance and containment of known pollutants when targeting aquatic habitats in the greatest need of conservation.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The Water Resources Division (WRD) of the USGS has on-going projects to study water quality and quantities in Connecticut (<http://ct.water.usgs.gov/>). The WRD initiated an intensive scientific survey of the water quality of the Connecticut, Housatonic and Thames River basins as part of the National Water-Quality Assessment Program in 1995 (<http://ma.water.usgs.gov/projects/MA-100/>); one of the results of this study was to issue fish consumption advisories for some rivers and lakes where contaminant levels in fish have exceeded safe levels. The scientists with the USGS have also collaborated with the CT DEP and others on population studies of the federally listed roseate tern, historic and current streamflow levels, the restoration of Atlantic salmon in the Connecticut River, and the presence and transport of toxic contaminants in the state's surface and groundwater.

The Biological Resources Division (BRD) of the USGS also has scientific programs to aid in the understanding and conservation of fish and wildlife resources within Connecticut (<http://biology.usgs.gov/state.partners/activities/ct-act.html>). Recent projects include the Connecticut River Initiative and the New England GAP. The Connecticut River Initiative is a BRD regional science initiative to bring diverse biological data from many sources together to enhance public and private decision making; the evaluation of various Atlantic salmon restoration techniques, including passage around migration obstructions, is an example of this program's initiatives. The New England GAP includes the development of a high-resolution vegetation map for an area in central and western Connecticut, which will be used as a pilot evaluation for the rest of New England (also see Section 4.1). In addition, the BRD maintains a repository of bird banding information and coordinates avian census projects, amphibian and reptile monitoring, and other biological studies through the Patuxent Wildlife Research Center in Maryland.

Connecticut GAP

A Gap Analysis Program (GAP) project was conducted for southern New England (Griffith et al. 1997 and Zuckerberg 2004). The GAP project resulted in further work and refinement in Massachusetts (MA) and the BIOMAP project there. The Connecticut portion of GAP was most recently completed and vertebrate models are now developed for this area (Figure 4.1).

Gap analysis is a scientific method for identifying the degree to which native animal species and natural communities are represented in our present-day mix of conservation lands. Those species and communities not adequately represented in the existing network of conservation lands constitute conservation "gaps." The purpose of the Gap Analysis Program is to provide broad geographic information on the status of ordinary species (those not threatened with extinction or naturally rare) and their habitats in order to provide land managers, planners, scientists, and policy makers with the information they need to make better-informed decisions.

The Gap Analysis Program is sponsored and coordinated by the Biological Resources Division of the U.S. Geological Survey. Additional support at the national level has been provided by the Department of Defense and the Environmental Protection Agency.

The program has a close working relationship with the National Mapping Division of the U.S. Geological Survey and with The Nature Conservancy.

U.S. Department of Agriculture

Natural Resources Conservation Service (NRCS)

The Natural Resources Conservation Service (NRCS) offers several programs for private landowners to conserve and protect fish and wildlife resources (<http://www.nrcs.usda.gov>). These programs typically are administered with the assistance of the USFWS and in Connecticut, the state Department of Agriculture. The grant programs offer a means for the state to collaborate with private landowners to achieve fish and wildlife conservation goals in a cooperative manner. The NRCS is also an active partner in the Long Island Sound Study program.

Conservation Security Program (CSP)

The Conservation Security Program (CSP) is a relatively new voluntary conservation program that rewards farmers and ranchers in high priority watersheds that maintain and enhance the highest standards of environmental stewardship on their lands. Criteria for recognition include conservation of wetlands, water and soil quality preservation, and demonstration of “exceptional” conservation efforts by enhancing natural resource conservation measures above required levels (e.g., installing riparian forested buffers to provide shading of aquatic habitats for fishery resources). Recognized enhancement measures include addressing locally identified conservation needs, participating in watershed related activities, on-farm conservation research and demonstration projects, assessment and evaluation activities, and installing supplemental conservation measures beyond those required for other programs (<http://www.nrcs.usda.gov/programs/farmland/2002/>). Participants are eligible to receive up to \$45,000 annually over 5 to 10 years for maintaining these high standards of environmental stewardship.

Environmental Quality Incentive Program (EQIP)

In cooperation with the Connecticut Department of Agriculture's “Partnership for Assistance on Agricultural Waste Management Systems”, the USDA Environmental Quality Incentive Program (EQIP) provides cost sharing for agricultural improvements that will help meet water quality and other environmental objectives. Based on state priorities, EQIP offers 5 to 10 year contracts that provide

incentive payments and cost sharing for conservation practices such as watershed protection measures. The EQIP obligated \$3,056,930 for 33 Connecticut landowner projects in FY2003 and allocated \$8,021,300 in FY2004.

Farm and Ranch Lands Protection Program (FRPP)

The Farm and Ranch Lands Protection Program (FRPP) provides matching funds to state, tribal or local governments, and non-governmental organizations to purchase conservation easements to protect existing farm and ranch lands. Participating landowners agree not to convert their land to non-agricultural uses and to implement conservation plans for any highly erodible lands on their property (<http://www.nrcs.usda.gov/programs/farmland/2002/>). The FRPP obligated \$1,980,875 to protect 811 acres of Connecticut farm and ranch lands in FY2003 and allocated another \$2,575,700 for FY2004. There is a high interest amongst Connecticut agricultural landowners to participate in the FRPP, as an additional \$7,239,575 in unfunded requests were received by the NRCS in FY2003; these requests already had non-federal cost-sharing partners identified, representing a significant unfunded opportunity to preserve agricultural habitats in Connecticut.

Grassland Reserve Program (GRP)

The Grassland Reserve Program (GRP) is a new voluntary program that allows landowners to preserve and restore grassland while maintaining their use for grazing. The program allows for permanent or 30-year conservation easements to be placed on grasslands (preferably those exceeding 40 contiguous acres), while allowing the landowner to continue grazing, harvest hay or seeds (subject to restrictions for some grassland nesting birds), construct fire breaks or fences, and conduct fire rehabilitation on the grassland. Rental agreements are another program option; agreements span 10 to 30 year periods and pay the landowner up to 75% of the grazing value of the property. The GRP also provides funds for restoring grasslands enrolled in the program, with the goals of maintaining or enhancing biodiversity, protecting water quality, preserving open space and scenic vistas, and reducing soil erosion (<http://www.fsa.usda.gov/dafp/GRP/default1.htm>). Grasslands and pasture within the Connecticut River Valley have specifically been identified as threatened (by conversion) by the USDA and receive higher rankings for funding than other grasslands. In FY2004, the NRCS allocated \$702,100 to enroll grasslands in Connecticut in the GRP.

Wildlife Habitat Incentives Program (WHIP)

The Wildlife Habitat Incentives Program (WHIP) provides technical and financial assistance to landowners to create high quality aquatic, riparian, wetland and upland habitat areas that support wildlife populations of local, state, national or tribal significance. Any non-federal landowner is eligible to enroll in the program, including state agencies. The program was initiated in 1998 and uses

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

wildlife habitat development plans to implement either short-term (5 to 10 year) or long-term (greater than 15 years) cost-sharing agreements with the property owner. Habitat areas for species that are showing significantly reduced or declining populations, fishery and wildlife habitats that have been identified in need of conservation by local, state and Tribal partners, and conservation projects that benefit fish and wildlife resources that may not otherwise be funded all receive priority for enrollment in WHIP (<http://www.nrcs.usda.gov/programs/farmland/2002/>).

The NRCS develops State WHIP Plans to prioritize habitat needs and areas within each state. The Connecticut WHIP has identified four priority habitats for enrollment: riparian areas, grasslands, old fields, and tidal and freshwater wetlands. In FY2003, the NRCS obligated \$398,339 to enroll 448 acres of Connecticut land into WHIP. Another 1,133 acres across 43 properties requested enrollment in the program but were unfunded, representing a high interest amongst Connecticut landowners in the program. The FY2004 allocation by NRCS for Connecticut WHIP projects increased to \$628,000. The Connecticut WHIP has also participated in collaborative restoration projects under the Long Island Sound Study.

Wetlands Reserve Program (WRP)

The NRCS also operates a Wetlands Reserve Program (WRP), which targets the enhancement of wetlands by retiring them from marginal farm production uses. The restoration of wetland areas and the development of wildlife recreational opportunities in these areas are the goals of WRP. The WRP utilizes conservation easements and cost-sharing restoration agreements to restore and protect wetland habitats. Compatible uses such as fishing, hunting, outdoor recreational activities and some agricultural practices (e.g., grazing, hay production, wood harvest) may be allowed on enrolled lands so long as they are consistent with the protection and enhancement of the wetland's functions and values (<http://www.nrcs.usda.gov/programs/farmland/2002/>). In FY2003, Connecticut was allocated \$35,800 to enroll lands in WRP, and in FY2004 the allocation was \$38,400.

U.S. Forest Service

There are no National Forests within the state of Connecticut. Nevertheless, the U.S. Forest Service (USFS) offers technical and financial assistance to states; operates national programs on invasive species, forest and rangeland management (including fire), and biological diversity; and tracks the status, distribution and health of forestland throughout the country (<http://www.fs.fed.us/>).

According to the USFS Forest Inventory and Analysis program, Connecticut had 1.9 million acres of forest in 1998, covering 60% of the state's land area (<http://www.fs.fed.us/ne/fia/states/ct/index.html>). The USFS did not detect a significant change in the amount of

forestland in Connecticut between 1985 and 1998, but the proportion of forestland classified as “urban forest” increased from 44,000 to 117,000 acres during this period (a 165% increase). The dominant forest type is oak/hickory (51% of the timberland), with northern hardwoods making up the bulk of the rest of timberland forest type (29%). The remaining forest types are elm/ash/red maple (9%) and white/red pine (7%). The USFS has also determined that the red maple is the most common tree in the state, with sweet birch the second most common species and eastern hemlock the third. Red oaks and red maple are the most harvested tree species on Connecticut’s timberlands.

National Resources Inventory Program

The U.S. Department of Agriculture has been monitoring the status and trends of non-federal land use through its National Resources Inventory (NRI) Program for many years. According to these data, Connecticut has one of the highest proportions of developed land in the country (<http://www.nrcs.usda.gov/technical/NRI/>). Between 1992 and 1997, approximately 39,400 acres of land were converted from undeveloped to developed land use in Connecticut, for an average conversion of 7,900 acres of non-federal land a year. This trend is slower than the state’s long-term development rate of 8,400 acres/year from 1982 to 1997. Altogether, the NRI estimates that 83,900 acres of non-federal land were developed in Connecticut between 1982 and 1997. Although this conversion rate ranks 43rd in the nation for 1992-97, the state ranks fourth in the country in the proportion of non-federal land (28.6%) that was developed within the state in 1997 (USDA 2000).

Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) is the federal agency responsible for enforcing the Clean Air Act, Clean Water Act, and other environmental regulations that protect Connecticut’s fish and wildlife resources. The agency has a specific presence in Connecticut through its coordination of the Long Island Sound Study, with its Long Island Sound Office in Stamford (<http://www.epa.gov/region01/eco/lis>). Through the Long Island Sound Study (LISS), CT DEP has collaborated with the EPA and other partners to monitor hypoxia and nutrient loads in the Sound, map benthic habitats, restore vital coastal and marine habitats, and increase public awareness of the threats to the Sound. Between 1998 and 2001, the LISS restored 336 acres and 39 river miles of Long Island Sound habitat. The EPA has funded numerous conservation projects in the Sound through the LISS. The LISS has a goal of restoring 2,000 acres and 100 river miles of Long Island Sound habitat by 2008.

In addition, the EPA, in conjunction with CT DEP’s EGIC, completed a process similar to this CWCS in 1997 which pulled together hundreds of experts in related natural resource arenas to identify the key resource areas in need of protection in Connecticut. This

Resource Protection Areas Project process and resulting maps provided background material for both The Nature Conservancy's Ecoregional Conservation Plan for the North Atlantic Coast and this Connecticut CWCS plan.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) administers several natural resource programs that effect Connecticut's fish and wildlife resources (<http://www.noaa.gov>). The National Ocean Service (NOS), National Weather Service (NWS) and the National Marine Fisheries Service (NMFS, or NOAA-Fisheries) are all agencies within NOAA. NOAA is the primary federal agency charged with protecting the nation's marine resources, including federally listed marine species such as sea turtles (when they are in the water; the USFWS has jurisdiction over nesting sea turtles) and shortnose sturgeon. Federal fishery management plans (FMPs) and the implementation of Essential Fish Habitat (EFH) regulations is also NOAA functions. As a result of these interests, NOAA maintains a research and regulatory presence in Long Island Sound and also participates in the relicensing of hydropower dams on Connecticut rivers (with a particular concern for anadromous fish).

The Connecticut Sea Grant Program falls under the NOAA as well (Section 4.2). The NOS's Office of Ocean and Coastal Resource Management oversees state coastal zone management agencies (the Office of Long Island Sound within CT DEP), authorizing and funding their management programs (<http://coastalmanagement.noaa.gov/>). The agency's Coastal Services Center has provided funding and educational resources to the CT DEP Office of Long Island Sound Program, collaborated with UCONN on the NEMO program (Section 4.2), and has funded research projects to develop decision-support tools related to the management of coastal habitats, impervious surfaces and beach nourishment (<http://www.csc.noaa.gov/>). NOAA is the leading federal agency regarding the research and restoration of submerged aquatic vegetation (SAV) and has collaborated with (and funded) the Long Island Sound Study on numerous restoration projects in Connecticut.

In addition, NOAA's Office of Response and Restoration produces oil spill ecological risk maps and responds to the clean-up and restoration of damaged ecosystems following oil and fuel spills (<http://response.restoration.noaa.gov>). NOAA also manages a national network of National Estuarine Research Reserves, but none are located in Connecticut (<http://nerrs.noaa.gov>).

National Park Service

The National Park Service (NPS) maintains a portion of the Appalachian National Scenic Trail in northwestern Connecticut, the Weir Farm National Historic Site in the southwestern part of the state in Ridgefield and Wilton, and coordinates the Quinebaug and Shetucket Rivers Valley National Heritage Corridor. Over 51 miles of the Appalachian National Scenic Trail runs through

Connecticut along the Housatonic River valley and the Taconic Mountains (<http://www.nps.gov/appa/index.htm>). The Weir Farm consists of 74 acres that preserve the farm of American Impressionist painter J. Alden Weir (1852-1919); the NPS maintains the farm for its historic artistic landscape and operates visiting and resident programs for present-day artists (<http://www.nps.gov/wefa/index.htm>). Finally, the NPS is collaborating with private and business entities, non-governmental organizations, local and state governments to preserve a National Heritage Corridor along the Quinebaug and Shetucket Rivers (www.thelastgreenvalley.org). Although the NPS owns no federal land as part of this conservation effort, the agency lends technical expertise and resources to the project.

Department of Defense

The U.S. Department of Defense operates five military bases within Connecticut. The Air Force operates the Bradley IAG Air National Guard base at Windsor Lock (126 acres), along the Connecticut River, and the Orange Air National Guard base in New Haven (29 acres). The Navy operates the New London Submarine Base on the Thames River at Groton (1812 acres). The Army maintains an engine production plant in Stratford (115 acres) and an Army National Guard Major Training Center in Niantic named Camp Rowland. In addition, the U.S. Coast Guard, which falls under the Department of Homeland Security, operates the U.S. Coast Guard Academy in Groton and maintains bases along the Connecticut coast.

Altogether these military bases account for over 2,082 acres of federal land ownership in Connecticut. Each base is required to develop Integrated Natural Resource Management Plans (INRMP) for the management of fish and wildlife resources on their lands. Through the Defense Environmental Restoration Program, the U.S. Army Corps of Engineers coordinates with CT DEP on the investigation, clean-up and restoration of 55 current and former military facilities in the state that may be contaminated by hazardous of toxic waste, contain unexploded ordnance, or have unsafe structures and debris.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) is the federal agency that oversees the protection of wetlands and waters of the U.S. through the Section 404 of the Clean Water Act permit program and the Section 10 of the Rivers and Harbors Act permit program. These permit programs protect the wetlands and waters of Connecticut by avoiding, minimizing and mitigating for impacts to these important habitats. The New England District of the USACE is located in Concord, Massachusetts (<http://www.nae.usace.army.mil>). The Water Management Section of the New England District monitors river and reservoir levels, managing both water quantity and quality in many of Connecticut's rivers and lakes. The USACE operates 12 flood control dams and many of their resulting lakes,

which are co-managed for natural resource and outdoor recreation uses (e.g., Black Rock Lake, Mansfield Hollow Lake, Colebrook River Lake).

The Civil Works program of the USACE New England District is responsible for dredging federal navigation channels and harbors in Connecticut (e.g., Bridgeport, New Haven, Norwalk), as well as the management of the resulting dredged materials. This section of the USACE designs, constructs and manages a variety of water resource development projects in the state, including aquatic ecosystem restoration, flood control, and shoreline stabilization projects; the CT DEP is a partner on many of these projects, including the USACE's collaboration with the Long Island Sound Study. The USACE has partnered with the City of Stamford on a recent project to restore riparian and aquatic habitats along two miles of the Mill River and with Coastal America to identify potential dam removals, eelgrass restoration projects and enhancement of wetland and aquatic habitats in Connecticut.

Connecticut Tribes

Connecticut has two federally-recognized Native American tribes. In addition to contacting Connecticut's two federally recognized tribes, we also contacted Indian groups in this state, who have not received final federal recognition, but who are identified in state statutes as Indian groups. We contacted these groups because we wanted to be all-inclusive. Although the Department has been contacted by persons claiming to be connected to the state groups, we do not know if these state groups managed or administered programs that affected conservation of species of greatest conservation need.

Although we received information as to who to contact and which groups to contact, we did not independently verify this information or independently determine that the persons we contacted were authorized by the groups to speak for them.

We also did not ascertain or investigate whether any of these groups had their own leadership which the members supported or whether any of these groups were self-governing.

We also did not ascertain or investigate whether the members of any of these groups actually maintained significant social contacts and relationships with each other.

In addition, we did not ascertain or investigate whether the members of any of these groups were descended from an Indian tribe or tribes.

Mohegan Tribal Nation

The Mohegan, a federally recognized tribe, own the 240-acre Mohegan Indian Reservation along the west bank of the Thames River south of Norwich, near the village of Uncasville (<http://www.mohegan.nsn.us>). This tribal nation was recognized officially by the state of Connecticut in 1638, but did not receive its federal recognition until 1994. The tribe operates the Mohegan Sun Casino, the third largest casino in the country, from which revenues are generated to support the tribe's cultural and land management programs. The Mohegan also operate the Tantaquidgeon Indian Museum, the oldest Indian-run museum in the United States, in Uncasville.

This tribe has developed exemplary energy and emissions efficiency and clean up programs. Their natural resource projects include wetland restoration and fish passageways and additional opportunities exist for both terrestrial and aquatic collaborative SWG projects.

Mashantucket Pequot Tribal Nation

The Mashantucket Pequot Tribal Nation, federally recognized in 1983, is a member of the Native American Fish and Wildlife Society (NAFWS) and has previously received SWG funding from the USFWS (<http://www.pequotmuseum.com>). The Mashantucket Pequot Indian Reservation is the largest parcel of tribal land in the state, covering 1,250 acres. The tribe is actively pursuing the preservation of 500 acres of Great Cedar Swamp and offers cultural and natural resource educational programs through its Mashantucket Pequot Museum and Research Center. The Foxwoods Resort and Casino is operated by the Mashantucket Pequot, providing a source of funding for the tribe's archaeological, educational and land management initiatives.

This tribe was successful in receiving a tribal SWG grant which is now underway on fox research. Additional opportunities exist for conserving the wildlife and habitat in greatest need of conservation on these lands.

Key Non-governmental organization (NGO) Programs and Projects

The Connecticut Department of Environmental Protection is assisted by two advisory councils, the Citizens Advisory Council (CAC) and the Fisheries Advisory Council (FAC). The members of these Councils represent academic, business, municipal, non-governmental organization (NGO), and public citizen interests. The Councils serve in an advisory capacity, providing technical and public comments to CT DEP on proposed policies, rules and regulations. Several of the conservation organizations in the state that regularly partner with CT DEP on fish and wildlife conservation programs and projects are discussed below.

National Audubon Society

The National Audubon Society (<http://www.audubon.org>) is a non-profit NGO that protects birds and their habitats throughout the world. In a partnership with the American Bird Conservancy, the National Audubon Society has established the Important Bird Areas (IBA) program that identifies the most critical locations for breeding, migrating and wintering birds (<http://www.audubon.org/bird/iba>). The IBA program is proactive and scientifically-based, and sites are carefully screened based on several ecological criteria. These criteria include whether the site supports threatened, endangered or high conservation priority species; species with restricted ranges; high concentrations of a species or group for breeding, migration or overwintering; species that are vulnerable due to a concentration in a specific habitat or biome; and/or sites that are valuable for long-term research and monitoring that significantly contribute to bird conservation, education or ornithology. Fifteen IBAs have been designated in Connecticut and another 22 are under scientific review. The designated sites are listed in Table 4.2.

The state chapter of the National Audubon Society, Audubon Connecticut, coordinates the identification, development and designation of IBA sites throughout the state. The chapter has recently drafted a Bird Conservation Strategic Plan, identifying six priorities for the group's bird conservation efforts in Connecticut. These priorities include staffing the IBA program, the public announcement of 75 IBAs within three years, developing and implementing conservation plans for designated IBAs, completing an inventory of all IBAs within five years, developing a major campaign for bird conservation in Long Island Sound, and making sure that the conservation recommendations of the Connecticut Grasslands Working Group are implemented. Audubon Connecticut has been an active participant in the development of this CWCS plan.

Announced Important Bird Areas (IBA) designated by the National Audubon Society in Connecticut. The size of each IBA is provided in parentheses.

Great Captains Island (18 ac)	TNC's Devils Den Preserve (1,750 ac)
Greenwich Point Park (147+ ac)	Bent of the River Audubon Center (~650 ac)
Audubon Center in Greenwich (522 ac)	White Memorial Foundation (~4,200 ac)
Cove Island Park and Holly Pond (83+ ac)	Station 43, South Windsor (~10 ac)
Lighthouse Point Park (84 ac)	Sandy Point (66+ ac)
East Rock Park (426 ac)	Connecticut College Arboretum (100 ac)
Falkner Island Unit of Stewart B. McKinney NWR (4.5+ ac)	Mamacoke Island/Smith Cove and adjacent coves (40.5+ ac)
Salt Meadow Unit of Stewart B. McKinney NWR (227+ ac)	

Connecticut Audubon Society

Connecticut Audubon is the oldest environmental non-governmental organization in Connecticut and was founded in 1898 (<http://www.ctaudubon.org>). This group is not affiliated with the National Audubon Society. The organization is an active partner in the conservation of avian resources and their habitats in Connecticut, focusing on education, conservation and advocacy. This NGO offers educational programs and opportunities for the public, and supports scientific research and monitoring of Connecticut's birds and their habitats. The organization owns and operates environmental 8 educational centers and 19 bird sanctuaries that have preserved over 2,200 acres of open space.

Connecticut Ornithological Association

The Connecticut Ornithological Association (COA) is a non-profit organization devoted to birds and birding opportunities in Connecticut (<http://www.ctbirding.org>). The group publishes scientific information on Connecticut's avian resources and collaborates with other organizations on their conservation. Through its Avian Records Committee of Connecticut, the COA maintains an official list of birds recorded throughout the state. The COA has been an active participant in the development of Connecticut's CWCS plan, particularly in the identification of specific research needs for countless bird species throughout the state and the identification of GCN species and their habitats.

The Nature Conservancy

The Nature Conservancy (TNC) has several programs and projects in Connecticut that are relevant to a Comprehensive Wildlife Conservation Strategy. TNC has a national program to identify, delineate and study the numerous ecoregions in the country. Connecticut's landscape falls within two of TNC's Ecoregions: the Lower New England – Northern Piedmont Ecoregion and the North Atlantic Coast Ecoregion. The non-profit TNC has completed Ecoregional Conservation Plans for both of these ecoregions, summarizing the natural resources within them, prioritizing habitats and species for conservation, and identifying conservation actions to conserve the species and habitats in greatest need of conservation. The information developed by these plans has been reviewed and incorporated into this CWCS plan.

In addition to these Ecoregional Conservation Plans, the Connecticut Chapter of TNC has completed a “Blueprint for Connecticut Conservation Map” (See Chapter 4) (<http://nature.org/wherewework/northamerica/states/connecticut>) that outlines the Last Great

Places within the state. The chapter has targeted six areas in the state for immediate conservation: the Saugatuck Forest Lands in Fairfield County; the Berkshire-Taconic Landscape (or Northwest Highlands) in northwestern Connecticut; the Meshomasic Forest Landscape in central Connecticut; the Tidelands of the Connecticut River; the Quinebaug Highlands Landscape in northeastern Connecticut (and southern Massachusetts); and the Pawcatuck Borderlands along the Connecticut-Rhode Island border. TNC has preserved portions of these landscapes (and others) already through land acquisition, conservation easements, and partnerships with water companies, other conservation organizations and the CT DEP (e.g., Barn Island near Stonington, Higby Mountain near Middlefield, Turtle Creek Preserve along the Connecticut River in Essex). Altogether, the Connecticut Chapter of TNC has preserved over 45,000 acres of land in the state on 55 nature preserves. The group also has ongoing conservation projects along the Salmon and Eightmile Rivers, focusing on both riparian corridor and aquatic habitats. This organization has been an active participant in the development of Connecticut's CWCS plan, particularly in the identification of habitats in the greatest need of conservation, threats to those habitats, implementable conservation actions, and have provided significant recommendations for TNC and CT DEP to collaborate to protect, restore, maintain, or enhance these conservation targets through the implementation phase of this CWCS.

Connecticut Forest and Park Association

The Connecticut Forest and Park Association (CFPA) is one of the oldest NGOs in Connecticut and has promoted the protection and enhancement of public and private natural forest resources through proper state and local land use planning, policies, laws, regulations, and on-the-ground practices (<http://www.ctwoodlands.org>). CFPA works cooperatively with a wide range of agencies, organizations and groups and thus fulfills the objective of the Comprehensive Wildlife Conservation Strategy. Working mostly on terrestrial forests, CFPA maintains parks and trails in Connecticut's forests and assists land acquisition efforts of the state, community land trusts, and conservation organizations by providing technical expertise and, when necessary, by acquiring land. The Association works cooperatively with many groups statewide, including the Land Conservation Coalition for Connecticut, to protect and preserve land for future generations.

CFPA provides a variety of high quality environmental education programs to a wide audience, including landowners, municipalities, teachers, students, natural resource professionals, and the conservation-minded public. CFPA also offers professional development workshops for formal and informal educators, student programs, scout badge programs as well as adult and family activities for members and the public.

Ducks Unlimited

Ducks Unlimited (DU) is another NGO that has active conservation programs in Connecticut (<http://www.ducks.org>). Focusing on the conservation of waterfowl, the goal of DU is “to become the leading waterfowl and wetlands conservation entity in North America” (Ducks Unlimited, 2001). Many of DU’s members are concerned with the maintenance of waterfowl hunting opportunities as well; the group was founded by hunters and 90% of its current members are waterfowl hunters. To aid in the pursuit of its goals, DU has completed a Conservation Plan that summarizes the group’s habitat conservation goals and strategies (http://www.ducks.org/conservation/conservation_plan.asp). In Connecticut, DU has committed over \$462,000 on conservation projects—conserving over 1,000 acres of waterfowl and wetland habitat. The approximately 3,000 Connecticut members of DU have enhanced wetlands, restored grasslands and arranged private land easements along the state’s coast, Connecticut River and elsewhere. The primary species that have benefited from these projects include wood duck, mallard, black duck, Canada goose, green-winged teal and blue-winged teal. The threats and conservation goals identified by DU have been incorporated into the development of this CWCS plan.

Trout Unlimited

Similar to Ducks Unlimited, Trout Unlimited (TU) is a NGO that strives to conserve coldwater fisheries populations and habitat throughout the country (<http://www.tu.org/index.asp>). The group’s members are largely trout and salmon fishermen, and their mission is to conserve, protect and restore coldwater fisheries and their watersheds throughout North America. Trout Unlimited has identified four key threats to coldwater fisheries: habitat loss and degradation, hydropower blockages of fish passage, unsustainable harvest of the fisheries, and the propagation of non-native, exotic or diseased fish through hatchery stocking efforts. As a result, TU has identified solutions to each of these threats and develops a National Conservation Agenda annually to implement them. In Connecticut, Trout Unlimited has eleven local chapters and councils who have implemented conservation projects along many of the state’s rivers and streams. The Mianus Chapter, for example, is partnering with the NRCS and the Town of Wilton in the Norwalk River Watershed Initiative to restore trout breeding and rearing habitat in the Norwalk River. Its members frequently conduct river clean-ups and assist the CT DEP in trout stocking operations in the state.

Ruffed Grouse Society

The Ruffed Grouse Society is devoted to the conservation of ruffed grouse, American woodcock and other forest wildlife populations and their habitat; many of its members are hunters (<http://www.ruffedgrousesociety.org>). This NGO has supported several scientific

studies and publications regarding habitat management techniques and the conservation biology of ruffed grouse and American woodcock (e.g., the Appalachian Cooperative Grouse Research Project). In Connecticut, the Ruffed Grouse Society has contributed to the conservation of these two game species by partnering with CT DEP to enhance over 3,000 acres of habitat on state lands in the Connecticut River valley.

Connecticut Waterfowl Association

The Connecticut Waterfowl Association represents the diversity of NGOs devoted to hunting, fishing and trapping in Connecticut. The mission of the group is “to preserve, reclaim, and enhance wetland and wildlife habitat in the state of Connecticut in a manner that promotes the wise use of our natural resources and the progress of society” (<http://www.ctwaterfowlers.org>). The organization holds seminars and educational programs on hunting safety and seasons, educates the public on the importance of wetland habitats, and acquires and manages wetland and associated upland habitats.

Coastal America

Coastal America is a partnership of federal natural resource and infrastructure agencies, military, NGOs, state, local, and tribal governments that facilitates the collaboration of expertise, resources and authorities to address threats to coastal and wetland habitats (<http://www.coastalamerica.gov>). Partners include state coastal management agencies, the U.S. Department of the Interior (USFWS, NPS, and Minerals Management Service), USACE, NOAA, USDA, EPA, the White House Council on Environmental Quality (CEQ), and the U.S. Departments of Housing and Urban Development, Energy, State, Transportation and Defense. The Coastal America Partnership has established several Coastal Ecosystem Learning Centers to improve public understanding of coastal issues and provide environmental education opportunities; one of these centers is located at the Mystic Aquarium Institute for Exploration (<http://www.mysticaquarium.org>). Through its Corporate Wetlands Restoration Partnership (CWRP) program, Coastal America incorporates private businesses in wetlands restoration projects. In Connecticut, Coastal America worked with Amtrak, CT DEP and the CT Department of Transportation to restore tidal flow and wetlands along transportation corridors during transportation infrastructure replacement projects. Nationally, Coastal America has collaborated with over 300 nonfederal partners to dedicate more than \$100 million to the conservation of coastal ecosystems.

Connecticut River Watershed Council

The Connecticut River Watershed Council (CRWC), founded in 1952, is a NGO in the Connecticut River watershed that seeks to improve water quality in the watershed and restore, conserve, wisely develop and use the natural resources found in the watershed (<http://www.ctriver.org>). The Council disseminates information to the public, produces publications relevant to its mission, and initiates partnerships and programs to help achieve its mission. The CRWC advocated the establishment of the Silvio O. Conte NWR, led the successful effort to have the Connecticut River designated as a federal “American Heritage River”, created a River Steward Program to have on-site advocates in the valley, helped protect over 8,000 acres of land in the watershed, and supported the removal of dams to restore anadromous fisheries habitat and efforts to restore salmon to the river and its tributaries. The organization’s Migratory Fisheries Restoration Initiative serves as both an advocate and a funding source for the latter two items through a partnership with CT DEP, the USFWS, other federal agencies and the other three watershed states. The Council also has a small grants program that funds academic studies of students relating to the watershed’s biology and/or environment.

Other Watershed Organizations

Connecticut has numerous watershed and river protection organizations, including the Rivers Alliance of Connecticut, which is a statewide coalition of 100 local groups (<http://www.riversalliance.org>). The mission of the Rivers Alliance is to assist these local and state NGOs, support and promote environmentally sound state public policies, and educate the public about aquatic habitats and water conservation. The coalition group has initiated collaborative partnerships with water companies to shape instream flow policies, land trusts and other environmental NGOs to maximize watershed protection efforts, and with state agencies and the legislature on water quality, quantity and hydropower policies and regulations. The Rivers Alliance also has partnered with Coastal America to identify a list of sites for potential aquatic restoration projects under the Corporate Wetland Restoration Program.

The Connecticut River Salmon Association, Save the Sound, and the Connecticut River Watershed Council are all members of the Rivers Alliance, exhibiting the range of local watershed protection efforts in the state. The Connecticut River Salmon Association focuses on the restoration of salmon to the Connecticut River, working with the USFWS, NMFS, and the four watershed states on the Connecticut River Atlantic Salmon Commission; it is based in Connecticut. The nonprofit corporation’s programs for public school education projects, fry stocking, and funding conservation biology research on Atlantic salmon garnered the U.S. Department of the Interior’s Conservation Service Award in 2002 (<http://www.ctriversalmon.org>). Save the Sound is an NGO devoted to the protection of Long Island Sound and is the only non-governmental partner in the Long Island Sound Study program with the state of Connecticut and various federal agencies; the group has a water quality monitoring program in the sound, conducts environmental education and outreach, and has identified over 400 sites for habitat restoration projects (see Section 4.6; <http://www.savethesound.org/index.htm>).

Land Trust Organizations

The Northeast region has the highest number of land trust organizations in the country; these non-profit organizations have protected 2.9 million acres of land across the region (Land Trust Alliance 2004).

Land trust conservation organizations seek to locally preserve land for natural resource purposes. The Trust for Public Land (<http://www.tpl.org>) is a national land trust organization and has partnered with CT DEP on the implementation of the Open Spaces Initiative. This organization has contributed to the Initiative's goal of protecting over 45,500 acres of the state's land through nonprofit NGOs by preserving parts or all of Skiff Mountain, Webb Mountain, Mather Meadows, the Mill River corridor, Chapman Mill Pond, the Hunt Hill Farm, and the lands surrounding the Hammonasset Reservoir; many of these projects were undertaken in partnership with local land trust organizations.

Connecticut has over 120 local land trust organizations, each of which has preserved portions of Connecticut's landscape (for a list see <http://www.lta.org/findlandtrust/CT.htm>). For example, The Old Lyme Conservation Trust has utilized private donations and CT DEP grants to preserve Watch Rock park in Old Lyme, install a fish passageway at the Lower Mill Pond Dam on Mill Brook, and conserve several riparian properties along the Connecticut River (<http://www.old-lymeconservtrust.org/menu.html>). The Essex Land Conservation Trust owns or manages eleven preserves totaling over 570 acres of wetland, grassland, open field, riparian, tidal marsh and forest habitats (<http://www.essexlandtrust.org>). The Greenwich Land Trust manages over 50 acres obtained through donations, purchase and conservation easement; properties include meadows, a coastal island, ponds and waterfront areas (<http://www.gltrust.org>). The New Hartford Land Trust has preserved over 270 acres of land on 19 separate properties around New Hartford, conserving forest, wetland, open field, streams and marsh habitats (<http://www.leachmichaud.net/NHLT/Index.html>). The Aspetuck Land Trust is devoted to the preservation of open space and the natural resources in and around Easton, Fairfield, Weston and Westport and has preserved over 1,700 acres of land to date (<http://www.aspetucklandtrust.org>). The Kent and Sharon Land Trusts have partnered with the Trust for Public Land on efforts to protect Skiff Mountain. The Roxbury Land Trust is one of the DEP's longest term partners contributing both management of open space and participation in field work for many non-game programs.

Source: Land Trust Alliance. 2004. National Land Trust Census. Washington D.C. <http://www.lta.org/census/>. Accessed September 12, 2005.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Websites for Partners and Stakeholders:

	<i>Website</i>
American Fisheries Society	http://www.fisheries.org
Aspetuck Land Trust	http://www.aspetucklandtrust.org
Atlantic States Marine Fisheries Commission	http://www.asafc.org/
Audubon Connecticut	http://greenwich.center.audubon.org/
Avian Records Committee of Connecticut	http://www.ctbirding.org/ARCC.htm
Bat Conservation International	http://www.batcon.org/
Coastal America	http://www.coastalamerica.gov
Connecticut Association of Conservation and Inland Wetlands Commission (CACIWC)	http://www.caciwc.org/
Connecticut Audubon Society	http://www.ctaudubon.org
CT Council on Environmental Quality	http://www.ct.gov/ceq/site/default.asp
Connecticut Coverts Program	http://www.canr.uconn.edu/ces/forest/coverts.htm
Connecticut Department of Agriculture	http://www.ct.gov/doag/site/default.asp
Connecticut Department of Environmental Protection (CT DEP)	http://dep.state.ct.us/aboutdep/progacti.htm
CT Geological and Natural History Survey	http://dep.state.ct.us/cgnhs/cgnhs.htm
Connecticut Greenways Program	http://www.dep.state.ct.us/stateparks/greenways/designated.htm
CT Natural Biological Diversity Database	http://dep.state.ct.us/cgnhs/nddb/nddb2.htm
CT Office of Long Island Sound Program	http://dep.state.ct.us/olisp/index.htm
CT Office of Policy and Management	http://www.opm.state.ct.us
Connecticut Ornithological Association	http://www.ctbirding.org
Connecticut River Estuary Regional Planning Agency (CRERPA)	http://www.crerpa.org/
Connecticut River Gateway Commission	http://www.crerpa.org/gateway.html
Connecticut River Salmon Restoration Association	http://www.ctriversalsalmon.org
Connecticut River Watershed Council	http://www.ctriver.org
Connecticut Sea Grant Program	http://www.seagrant.uconn.edu/
Connecticut Waterfowl Association	http://www.ctwaterfowlers.org
ConserveOnline	http://www.conserveonline.org/

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Cooperative Extension Service, UCONN	http://www.canr.uconn.edu/ces/
Ducks Unlimited	http://www.ducks.org
EGIC	http://dep.state.ct.us/cgnhs/index.htm
Environmental Protection Agency	http://www.epa.gov
EPA Long Island Sound Program	http://www.epa.gov/region01/eco/lis
Essex Land Conservation Trust	http://www.essexlandtrust.org
Farmington River Watershed Association	http://www.frwa.org/programs/
Golden Hill Tribe	http://paugussett.itgo.com
Greenwich Land Trust	http://www.gltrust.org
Green Valley Institute	http://www2.ncdc.noaa.gov/docs/gviug/
Important Bird Area Program	http://www.audubon.org/bird/iba
International Association of Fish and Wildlife Agencies (IAFWA)	http://www.iafwa.org/
International Marine Mammal Association	http://www.imma.org
International Shorebird Survey	http://www.shorebirdworld.org/
IUCN	http://www.redlist.org
Invasive Plant Atlas of New England	http://invasives.eeb.uconn.edu/ipane/
Long Island Sound Environmental Studies Program, USGS	http://woodshole.er.usgs.gov/project-pages/longislandsound/index.htm
Long Island Sound Soundkeeper	http://www.soundkeeper.org/
Long Island Sound Study	http://www.longislandsoundstudy.net/
Map and Geographic Information Center (MAGIC)	http://magic.lib.uconn.edu/
Mashantucket Pequot Tribal Nation	http://www.pequotmuseum.com
Mid-Atlantic Fishery Management Council	http://www.mafmc.org/mid-atlantic/mafmc.htm
Mohegan Tribal Nation	http://www.mohegan.nsn.us
Mystic Aquarium Institute for Exploration	http://www.mysticaquarium.org
National Audubon Society	http://www.audubon.org
National Estuarine Research Reserve Program	http://nerrs.noaa.gov
National Marine Fisheries Service	http://www.nmfs.noaa.gov/
National Oceanic and Atmospheric Administration (NOAA)	http://www.noaa.gov
NOAA Office of Ocean and Coastal Resource Management	http://coastalmanagement.noaa.gov/

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

NOAA Coastal Services Center	http://www.csc.noaa.gov/
NOAA Office of Response and Restoration	http://response.restoration.noaa.gov
National databases	http://www.pwrc/usgs.gov/birds
National Park Service	http://www.nps.gov
National Water Quality Assessment Program, USGS	http://ma.water.usgs.gov/projects/MA-100/
Native American Fish and Wildlife Society	http://www.nafws.org/
Natural Resources Conservation Service	http://www.nrcs.usda.gov
National Resources Inventory Program	http://www.nrcs.usda.gov/technical/NRI/
NatureServe	http://www.natureserve.org/
New England Fishery Management Council	http://www.nefmc.org/
New Hartford Land Trust	http://www.leachmichaud.net/NHLT/Index.html
North American Bat Conservation Partnership (NABCP)	http://www.batcon.org/nabcp/newsite/index.html
Northern Prairie Wildlife Research Center	http://www.npwrc.usgs.gov/
Old Lyme Conservation Trust	http://www.old-lymeconservtrust.org/menu.html
Partners in Amphibian and Reptile Conservation (PARC)	http://www.parcplace.org
Partners In Flight	http://www.partnersinflight.org/
Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/
Paucatuck Eastern Pequot Indian Tribal Nation	http://www.paucatuck.org/
Pew Oceans Commission	http://www.pewoceans.org
Quinebaug-Shetucket Heritage Corridor, Inc. (QSHC)	http://www.thelastgreenvalley.org
Regional Plan Association	http://www.rpa.org
Rivers Alliance	http://www.riversalliance.org
Roxbury Land Trust	http://www.nrlt.org/news.htm
Ruffed Grouse Society	http://www.ruffedgrousesociety.org
Save the Sound	http://www.savethesound.org/index.htm
Schaghticoke Tribe	http://www.schaghticoke.com
Silvio O. Conte National Wildlife Refuge	http://www.fws.gov/r5soc/
Southern New England-New York Bight Coastal Program, USFWS	http://www.fws.gov/r5nep/nep1.htm
Sportsmens Land Trust	http://www.sportslandtrust.org/
Trout Unlimited	http://www.tu.org/index.asp

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Trust for Public Land	http://www.tpl.org
U.S. Army Corps of Engineers, New England District	http://www.nae.usace.army.mil
U.S. Bureau of Indian Affairs	http://www.doi.gov/bureau-indian-affairs.html
U.S. Department of Agriculture	http://www.usda.gov
U.S. Fish and Wildlife Service (USFWS)	http://www.fws.gov
USFWS Fisheries Program	http://www.fws.gov/r5crc/
USFWS Migratory Birds Program	http://migratorybirds.fws.gov
USFWS National Wetlands Inventory	http://www.nwi.fws.gov
U.S. Forest Service (USFS)	http://www.fs.fed.us/
USFS Forest Inventory and Analysis Program	http://www.fs.fed.us/ne/fia/states/ct/index.html
U.S. Geological Survey (USGS)	http://www.usgs.gov
USGS Biological Resources Division	http://biology.usgs.gov/state.partners/activities/ct-act.html
USGS Water Resources Division	http://ct.water.usgs.gov/
University of Connecticut (UConn) CLEAR Program	http://clear.uconn.edu
UConn Biological Collections	http://collections2.eeb.uconn.edu/collections/chp.html
UConn Center for Conservation and Biodiversity	http://www.eeb.uconn.edu/bioconctr/
UConn NEMO Program	http://nemo.uconn.edu/
UConn Wildlife Conservation Research Center	http://www.canr.uconn.edu/nrme/programs/wildlife/wcrc/index.htm
Waterfowl Mid Winter Inventory data	http://www.pwrc.usgs.gov/library/duckdata/
Xerxes Society	http://www.xerxes.org

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Appendix 7b: CWCS Development Process and Schedule

This appendix outlines the major phases and tasks in the development process of the CWCS over a two-year timeline. The year 2003 falls in one column. The years 2004 and 2005 are presented in quarterly intervals.

TIMELINE	2003	2004				2005			
TASKS	2-4th Qtrs	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
I. Planning (project development, inventory and research)	X	X							
• Project planning and scoping	X	X							
• Planning meetings; conduct participant surveys	X	X	X						
• Develop communication and outreach materials – CWCS brochure	X	X	X	X	X				
• Research and inventory existing programs, plans, data and maps relevant to conservation in Connecticut	X	X	X	X					
• Contact staff, stakeholders and public regarding CWCS	X	X	X	X	X	X	X	X	X
II. Strategy development (8 key elements)	X								
A. ID species / habitats of greatest conservation need	X								
• Research and compile existing data	X	X	X						
• Develop GCN list referencing existing conservation priority lists and IAFWA selection criteria	X	X	X						
• Internal review of draft GCN list	X	X	X	X	X				
• Draft key habitats and cross with ecoregions		X	X						
• Assign species/habitat associations, refine GCN list		X	X	X	X				
• Conduct workshops, presentations, create website		X	X	X	X	X	X		
• Engage DEP staff, other agencies, stakeholders, and experts.	X	X	X	X	X				
• Review and refine species and habitat lists			X	X	X	X	X		

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

TIMELINE	2003	2004				2005			
TASKS	2nd - 4th Qtrs	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
<ul style="list-style-type: none"> Engage broader public – comment submission through website 			X	X	X			X	
<i>B. ID conservation actions for each species/habitat</i>									
<ul style="list-style-type: none"> Research and compile existing data 		X	X	X	X				
<ul style="list-style-type: none"> Engage agency staff and stakeholders- workshops 		X	X	X	X	X	X	X	
<ul style="list-style-type: none"> Conduct presentations, distribute updates, prepare articles 		X	X	X	X	X	X		
<ul style="list-style-type: none"> Review and refine and prioritize conservation actions 			X	X	X	X	X	X	
<ul style="list-style-type: none"> Engage broader public – drafts published on website 			X	X	X	X	X	X	
<i>C. Develop monitoring and evaluation strategy</i>			X	X	X	X			
<i>D. Develop maps and supporting materials</i>	X	X	X	X	X	X	X	X	
III. Write and refine Strategy									
<ul style="list-style-type: none"> Outline and format 	X	X	X	X					
<ul style="list-style-type: none"> Draft Strategy 				X	X	X	X	X	
<ul style="list-style-type: none"> Internal review, and informal federal review, and revisions 						X	X	X	
<ul style="list-style-type: none"> Engage stakeholders and broader public – chapter drafts published on website 						X	X	X	X
IV. Final Strategy submitted								X	
V. Implementation through DEP and partners begins and continues through 2015									X
<ul style="list-style-type: none"> Promote and distribute CWCS to conservation partners 									X

Appendix 7c: Survey Results from Regional Municipality Workshops 2004-2005

This appendix provides an example of the input solicitation and results from partners during the CWCS process. In addition to the state and federal partner outreach effort (surveys of internal and external DEP programs) as well as stakeholder and public surveys, an extensive outreach effort to localities was made. Six regional workshops were conducted during 2004-2005 as outreach to local partners for wildlife diversity conservation. Local representatives from many different disciplines (planning, zoning, conservation, wetland, soil and water at the board, commission, and staff level etc.) participated and responded to a survey form. Two questions directly solicited their input on: 1) CWCS conservation priorities and 2) issues or threats to these conservation priorities.

Question 1: What should be a conservation priority in CT?

Forty-one municipal representatives responded about what they feel should be conservation priorities for Connecticut. Of these, 11 of them (27%) felt that open space, or unfragmented areas in general, need to be conserved. Eleven respondents (27%) listed forests in general. Twenty-one (51%) listed wetlands in general, watersheds, or water quality as a priority. Out of all 41 respondents, 4 (10%) listed riparian communities, 5 (12%) listed vernal pools, 5 listed rivers and streams, 4 listed salt marshes or tidal areas, and 3 people (7%) specified Long Island Sound. Eight respondents (20%) listed farmland, grassland, or early successional habitat as being a priority. Two people (5%) listed the importance of conserving native plants, 1 of those specifying forest understory plants. Nine (22%) listed the importance of creating and/or conserving wooded or vegetated corridors. One person (2%) felt that all species and natural communities should be a priority. One person felt that uncommon communities should be a priority. Examples of these that were listed by other respondents included sand plains (1 person) and cedar swamps (1 person). One person listed mammals as a conservation priority. Three (7%) listed birds such as ruffed grouse and waterfowl. One person listed reptiles and amphibians, and 1 person listed insects such as butterflies and moths. Three people felt that control of exotic invasive and nuisance species should be a priority. An example of a nuisance species was deer, specifically deer overbrowsing. Finally, 1 person felt that a conservation priority should be to address unnecessary land disturbance. Results are shown below in tabular form first summarized numerically by category of response and secondly by individual responses.

Conservation Priority	Total (n=41)	Percent
Wetlands in general, watersheds, water quality	21	51
Forests in general	11	27
Open space in general (unfragmented areas)	11	27

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Wooded or vegetated corridors	9	22
Farmland, grassland, early successional habitat	8	20
Vernal pools	5	12
Rivers and streams	5	12
Riparian areas	4	10
Salt marshes, tidal areas	4	10
Long Island Sound	3	7
Birds (e.g., grouse and waterfowl)	3	7
Native plants (e.g., forest understory vegetation)	2	5
Control of exotic invasive species	2	5
Unnecessary land disturbance	1	2
All species and habitats	1	2
Cedar swamps	1	2
Sand plains	1	2
Uncommon natural communities	1	2
Mammals	1	2
Reptiles	1	2
Amphibians	1	2
Insects	1	2
Control of nuisance wildlife (e.g., deer herbivory)	1	2

Individual responses to surveys follow along with the category assigned to it for summary compilation:

List of Individual Responses	Summary Category Assigned
Open space in general- space. Controlling nuisance animals such as deer that selectively graze and destroy habitat	Open space, nuisance species (e.g., deer)
Water quality, farmland	Water quality, farmland
Wetlands, salt marshes, woodland corridors	Wetlands, salt marsh, corridors
Cedar swamps, vernal pools	Cedar swamps, vernal pools
Sand plains, forests, salt marshes, streams	Sand plains, forests, salt marshes, streams
Forest understory plants, old field habitats, birds and butterflies,	Forest understory plants, old field habitats, wildlife related to old

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

moths and plants related to old field	fields
Natural habitats, preservation of open land/farm lands	Open space, native vegetation, early successional, farmland
Wetlands, forests, tidal marshes	Wetlands, forests, tidal marshes
Open space preservation (forests, grasslands, etc.) and connecting corridors between these	Open space, corridors
Proposed watersheds	Watersheds (Open space)
Corridors	Corridors
Wetlands, water, forests, creating meaningful greenways	Wetlands, forests, corridors
Regulation changes that address unnecessary land disturbance	Land disturbance
Long Island Sound & public waterways, vernal pools	LIS and public waterways (streams), vernal pools
Long Island Sound- wetlands	LIS, wetlands
Conservation of meadow- Ruffed Grouse	Old field habitat, grouse
Preservation of open space	Open space
Those that are rare, large and undeveloped linkages	Open space, corridors
Mammals	Mammals
Forested land space-contiguous forests farmland	Forests, farmland
Open farmland/contiguous greenways to support a diverse habitat base with large tracts of unfragmented land	Open space, farmland, corridors
River plains	Riparian
Habitat fragmentation, loss space- all species and habitats	Open space, all species and habitats
Free-flowing rivers, lower Connecticut River Basin, SE CT Highlands, Berkshires, Taconic-NW CT, NE CT Forests	Rivers, forests
Uncommon habitats	Uncommon habitats
Wetlands and open space	Wetlands, open space
Public education to the importance of wetlands conservation	Wetlands, emphasized education
Watersheds, forests	Watersheds, forests
'The Green Corridor'	Corridors
Conservation of wetlands and watercourses, vernal pools and riparian corridors. Conservation of native plant species and efforts to limit or remove evasive habitat as practical	Wetlands, rivers, vernal pools, corridors (riparian), native plant species, exotic invasives

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Protecting the remaining unfragmented forest and other open space	Forests, open space
Long Island Sound, inland areas being eaten up by development	LIS, open space
Various-in balance space- forest, wetland, open, farm	Forest, wetland, farmland
Open woodlands, watercourses (access and quality)	Forest, rivers
Coastal, large tracts of upland mature forest, riparian	Tidal marshes, forest, floodplain (riparian)
Vernal pools, wetlands	Vernal pools, wetlands
Large forest blocks and corridors	Forests, corridors
Water resource areas, aquifer areas and supporting habitats and communities	Wetlands
Control of exotic invasives in all ecosystems	Control of exotic invasives
Vernal pool habitats, broad wildlife corridors	Vernal pools, corridors
Waterfowl, reptiles, amphibians	Waterfowl, reptiles, amphibians

Question 2: What is preventing us from achieving these conservation goals?

When asked to give reasons for issues and problems that are preventing certain conservation goal attainment in CT, 42 municipal representatives responded. Eighteen of these people (43%) said that a lack of knowledge and/or awareness of the issues related to conservation were reasons. Fifteen people (36%) said a lack of funding. Eleven people (26%) cited the pressure to develop land. Six people (14%) listed private property rights. Five people (12%) listed poorly planned or unplanned development. Four people (9%) listed political or governmental pressure, or a lack of regulations. Three people (7%) said that human greed was a reason. Two people (5%) listed competing priorities as a reason. Finally, one person each (2%) said that population growth and a changing economy were reasons. Results are shown below in tabular form first summarized by category of response and secondly individual responses listed.

What is preventing us from achieving these conservation goals?	Total (N=42)	Percentage
Lack of knowledge and awareness	18	43
Lack of funding	15	36
Development pressure	11	26

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Private property rights	6	14
Poor planning	5	12
Political (governmental) pressure, lack of regulations	4	9
Greed	3	7
Competing priorities	2	5
Population growth	1	2
Changing economy	1	2

Individual responses to surveys follow along with the category assigned to it for summary compilation:

List of Individual Survey Responses	Summary Category Assigned
Lack of interest and funding	Lack of funding
Money, being able to say "no." Not knowing real impacts of activities. Balance between competing priorities.	Lack of funding. Development pressure. Lack of knowledge and awareness. Competing priorities.
Poorly planned and unplanned development	Poorly planned development
Private property rights, "economic development"	Private property rights. Development pressure.
Development, lack of planning, lack of awareness	Development pressure. Lack of knowledge and awareness. Poor planning
Money, lack public understanding	Lack of funding. Lack of knowledge and awareness
Rapid growth	Development pressure
Population growth space- but we are conserving	Population growth
Most likely lack of funds, lack of community understanding, and pressure from developers and associated political figures	Lack of funding. Lack of knowledge and awareness. Development pressure. Political pressure.
Competing agendas	Competing priorities
Lack of knowledge, some are already developed, lack of funds, property rights issues, lack of resources	Lack of knowledge and awareness. Lack of funding. Private property rights.
Often the state	Government pressure
Lack of regulations and education	Lack of regulations (government pressure). Lack of knowledge and awareness
Money and knowledge	Lack of funding. Lack of knowledge and awareness

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Knowledge	Lack of knowledge and awareness
Economic changes in family farms	Changing economy
Money and the will to do what needs to be done. Seems to be happening to some degree-things take time to brew and time is precious when biodiversity is concerned	Lack of funding. Lack of knowledge and awareness.
Rights of private property owners	Private property rights
Lack of funding and money	Lack of funding
Education of landowners and elected officials, traditional NE attitude - do what I want with my land	Lack of knowledge and awareness. Private property rights
Lack of knowledge, greed	Lack of knowledge and awareness. Greed.
Lack of information! Needs of species what is there and so on	Lack of knowledge and awareness.
Pace of development, lack of money, (e.g. State funding for open space)	Development pressure. Lack of funding.
Lack of understanding, lack of data, lack of general public interest	Lack of knowledge and awareness (of scientists and the public).
Progress and development	Development pressure.
Money	Lack of funding.
Poor planning and regulations	Poor planning. Lack of regulations (government pressure).
Land use development pressure	Development pressure.
Individual greed expressed through development and need for towns to expand grant list	Greed. Development pressure.
Money, understanding of issues	Lack of funding. Lack of knowledge and awareness.
Money and people, greed	Lack of funding. Greed.
Ignorance of cost space- value benefit an lack of urgency due to this- perception of our development rate	Lack of knowledge and awareness.
Money	Lack of funding.
Home rule	Private property rights.
Reactive, not proactive land use decision making	Poor planning.
The unprecedented rate of growth in NE CT	Development pressure.
Money	Lack of funding.
Development practices	Development pressure. Poor planning.

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Ignorance and complacency	Lack of knowledge and awareness.
Property rights space- lack of education	Private property rights. Lack of knowledge and awareness.
Lack of priority and funding at local and state levels	Lack of funding. Lack of knowledge and awareness
Current administration	Political pressure.

Appendix 8a: List of Stakeholders, Collaborators, and Experts

This appendix lists Connecticut's stakeholders that were contacted in the development of this CWCS. These stakeholders received email, mail, phone and personal meetings, presentations, or workshops for information and input on the development and implementation of Connecticut's CWCS.

1) Academic Stakeholders, Collaborators and/or Experts Consulted

<i>Institution</i>	<i>Contacts)</i>
Connecticut College	Staff
UCONN Departments of Fisheries and Wildlife, Forestry Veterinary School EEB	Natural Resources- -See meeting attendance list See meeting attendance list See meeting attendance list Staff
Scientific Advisory Committee 5 Taxa Committees representing Numerous Academic Institutions and organizations	(Taxa experts) see member list
University of Rhode Island	Coastal Institute staff

2) Federal Government Stakeholders, Collaborators and/or Experts Consulted

<i>Agency</i>	<i>Contact</i>
Army Aviation Support Facility	Bradley International Airport
U.S. Army Corps of Engineers	Park Managers, Colebrook River Lake Office
U.S. Army Corps of Engineers	Park Manager, Hop Brook Lake
U.S. Army Corps of Engineers	Park Manager, Mansfield Hollow Lake Office
U.S. Army Corps of Engineers	Park Manager, Thomaston Dam Office
U.S. Army Corps of Engineers	Regional Office
U.S. Coast Guard Academy	Staff

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

U.S. Coast Guard Group/ MSO	Staff
U.S. Department of Agriculture, Natural Resource Conservation Service	State Conservationist
U.S. Department of Agriculture, Natural Resource Conservation Service	State Executive Director
U.S. Department of Agriculture, Cooperative Extension Service	UCONN Office staff
U.S. Department of Agriculture	Wildlife Services
U.S. Fish and Wildlife Service	Silvio O. Conte National Wildlife Refuge Stewart B. McKinney National Wildlife Refuge
U.S. Fish and Wildlife Service Federal Assistance Ecological Services	Region 5 staff- numerous divisions and staff Regional and Field Office (Concord, NH) Staff
U.S. Fish and Wildlife Service	Connecticut River-Long Island Sound Ecoteam
U.S. Fish and Wildlife Service	Migratory Birds Program
U.S. Geological Survey	CT District Chief
U.S. Naval Submarine Base	Staff
Department of Defense	Bradley Air National Guard
EPA	Resource Protection Area and Water Quality programs
Hartford Armory	Facility and Management Office
National Guard Armory	Staff

3) State, Regional and Local Stakeholders, Collaborators and/or Experts Consulted

<i>Agency</i>	<i>Contact</i>
Citizen's Advisory Council (CAC)	See member list
Fisheries Advisory Council (FAC)	See member list
Large landowners	To be initiated at appropriate time
Municipalities (planners, conservation commissions, etc.)	See MCA regional workshop attendees list
Soil and Water Conservation Districts	See MCA workshop attendees list

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Watershed Coordinators, CT DEP	Staff
CT Department of Agriculture	State Veterinarian
CT Department of Agriculture, Bureau of Aquaculture and Lab Services	Staff
CT Department of Agriculture, Farmland Preservation	Staff
CT DEP- multiple divisions, sections	See agency flow chart
CT DOT	Contact initiated, awaiting follow up

4) Tribal Stakeholders, Collaborators and/or Experts Consulted

<i>Association</i>	<i>Contact</i>
CT DEP	Indian Affairs Liaison
Golden Hill Indian Group	Website
Mashantucket Pequot Tribal Nation	Website
Mohegan Tribal Nation	Website
Native American Fish and Wildlife Society	Northeast Region contact; website
Paucatuck Eastern Pequot Indian Group	Website
Schaghticoke Indian Group	Website
U.S. Bureau of Indian Affairs	Website
U.S. Fish and Wildlife Service	Northeast Indian Affairs Coordinator

5) Private and Non-profit Organization Stakeholders, Collaborators and/or Experts Consulted

<i>Association</i>	<i>Contact</i>
Aquarion Water Company	Staff
Audubon Connecticut	Board and staff members
Beardsley Zoological Gardens	Director
Connecticut Audubon	Board and staff members
Connecticut Ornithological Association	Board and staff members
Connecticut Forest and Park Association	Staff

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Farmington River Valley Biodiversity Project	Staff
Green Valley Institute	Staff
Maritime Aquarium at Norwalk	Staff
The Metropolitan District	Barkhamsted Headquarters
Mystic Aquarium	President
The Nature Conservancy	Connecticut Chapter Staff
National Wildlife Federation	Staff
Northeast Utilities	Real Estate and Land Planning Staff
CT DOT	Division of Intermodal Planning and Environment
Weir Farm, National Historic Site	Superintendent

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Appendix 8b: Public Input Plan

This appendix summarizes the input plan that was designed for use in Connecticut's CWCS process to contact Connecticut's stakeholders and publics. It identified three tiers of stakeholders and developed appropriate messages, methods, and objectives for each group. The Bleiker Citizen Participation by Objective (CPO) and Systematic Development of Informed Consent (SDIC) techniques and programs were used to develop this plan and they were consulted for follow up during this process in order to develop the most effective methods for outreach to the many "publics" or PAI's.

CT's CWCS Bleiker CPO/SDIC worksheet results: Contact Method Type of Promotion	Audiences Targeted			Target Date during development of CWCS and Continuation through implementation of CWCS
	Group 1 Stakeholders- TWW, DEP, Taxa Fed/sate partners Collaborators Goal: Consult and collaborate	Group 2 Stakeholders- Interested but limited investment Goal: Inform and involve	Group 3 General Public Goal- Inform	
Direct Mail/email Fact sheets/ program material	Email, mail – begun 1/04	Email, mail- begun 1/04		Quarterly (Same as website- see below)
Direct mail/email Brochures/Flyers	Email, mail – begun 4/04 Brochures 1/05	Email, mail-begun 4/04 Brochures 1/05		Initial mailing, then distribute at meetings and presentations throughout 04-05
Website- Updated quarterly Phase 1- Introductory material Phase -2 GCN species/habitat info Phase 3- Conservation Actions, Threats Phase 4- Conservation Actions Draft Phase 5- Draft Plan update, Phase 6- final plan announcement Implementation updates 2-4/year	Maps and threats to help ID conservation Actions	X	X	Jan 04-05 Intro materials April- Species/Habitats July- GCN info and solicit Conservation actions - solicit input July 05 August- September- draft plan Jan 06 Approved Plan

CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

Planning Committee meetings DEP/agency internal memos- Inreach Expert/Taxa consultation/correspondence	X			Meeting- Every month monthly updates monthly emails minimum
Newsletters- put in org newsletters	X	X		Quarterly to every 6 months
Magazine articles- DEP or state conservation orgs	Begun 1-04 X	X	X	Quarterly to every 6 months
Public relations: press releases	Quarterly X	X	X	Quarterly with website updates
Workshop	January- Conservation Actions X	X	X	2 for Tier 1, possible invite to Tier 2
Exhibit /poster at Meetings	X	X		Every Possible state meeting; set up traveling exhibit
DEP staff and ESSAC briefing/report at all meetings possible	Distribute brochures, and updates	Distribute brochures, and updates	Distribute brochures, and updates	All meetings possible Develop schedule and list
Presentations to Tier 2 and 3 groups				As requested

The Citizen Participation by Objective (CPO) worksheet results identified the following specific techniques as the most effective to meet the communication objectives for the SWG CWCS: Open Meetings and Forums; Content-type Advice-Giving Advisory Committees, Existing Clubs, Groups Organizations and their newsletters; Existing School Systems and Institutions, and finally Electronic Bulletin Boards and Websites.

Appendix 8c: Public Participation Mechanisms

Wildlife Conservation Takes a Giant Step Forward in Connecticut

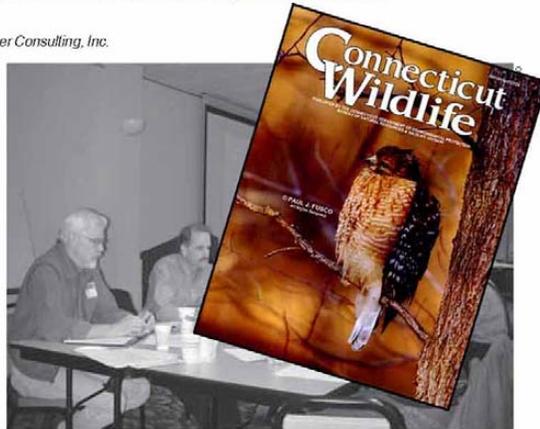
Written by Karen Terwilliger, of Terwilliger Consulting, Inc.

Wildlife conservation has a long and strong history in the United States. With its serious beginnings in the early 1900s, we have witnessed nearly a century of impressive wildlife restoration efforts. History has shown that major advancements in conservation have resulted from a combination of science, a deep commitment, and a stewardship ethic. This is exemplified by great conservation programs under the leadership of such notables as Aldo Leopold and Theodore Roosevelt. We again stand at the threshold of an unparalleled opportunity for comprehensive wildlife conservation at the national and state level as all 50 states are poised to develop their own Comprehensive Wildlife Conservation Strategy (CWCS).

Paving the Way

The conservation of wildlife can be viewed as much an art as a science. It requires a multifaceted approach and talents to address the changing landscape that we, the burgeoning human population, have sculpted. Changes in the amount, patterns, and structure of forests, fields, and wetlands have placed wildlife species in a new setting and context, one seldom far from encroaching human populations. This creates additional stressors and challenges to our native wildlife, as well as to the government agencies charged with the responsibility to conserve it. Adding to the complexity of this scenario, wildlife conservation tends to be on the short end of funding and attention. Federal and state agencies have done amazingly well with small budgets and few resources.

Historically, conservation efforts have been targeted at certain categories of wildlife. For example, the early and highly successful game and sport fish restoration programs of the Pittman-Robertson and Dingell-Johnson/Wallop-Breaux Federal Aid in Wildlife Restoration Acts provided for the successful restoration of many species. The establishment of the Wildlife Refuge System, Migratory Bird (Hunting Stamp) Act, and other important wetland legislation provided for the conservation



Members of the Connecticut Invertebrate Species Scientific Advisory Committee discuss habitat issues and long-term conservation concerns at a recent CWCS meeting at the Wildlife Division's Sessions Woods office.

of significant wetlands and wetland birds. The passage of the federal Endangered Species Act (as well as other important environmental legislation in the 1970s) established protection for the most critically endangered species.

And the story goes on...each piece of new legislation responding to a need or gap in the grand scheme of conservation, resulting in a new program with a new focused emphasis. As time goes on, the gaps narrow and the pieces start to come together. Although fragmented and piecemeal by default, wildlife conservation programs have come far and been carried by enthusiasm and commitment to this greater cause of natural resource stewardship.

Each program, targeted to address a piece of the broad spectrum of conservation, has made great strides forward but has seldom provided the funding and resources to effect holistic conservation. The term "unfunded mandates" certainly has had its place in wildlife conservation. Even though adequate funding hasn't been there, each piece of legisla-

tion provided an additional tool for the conservation toolbox.

Then, in 1980, came a big tool with a broader scope, but still no funding. This was the visionary Forsythe-Chaffee Act, commonly referred to as the Nongame Act. This legislation paved the way for more holistic conservation—one that would fill the biggest gap yet. The intent of this program was proactive and preventative: to keep common species common and, most importantly, to keep them from becoming endangered. What a great new approach for broad-based conservation.

But states were struggling to deliver such comprehensive conservation with limited resources. As a result, the Connecticut Department of Environmental Protection (DEP), like most other state conservation agencies, has struggled to deliver comprehensive wildlife conservation for its citizens. The DEP has done a remarkably good job considering all the aforementioned hurdles and the shocking fact that

continued on next page

Connecticut's Comprehensive Wildlife Conservation Strategy
"Creating a vision for the future of wildlife conservation"

Introduction
Note: A draft (PDF 1.43M, 41pp) of the first three Chapters of Connecticut's Comprehensive Wildlife Conservation Strategy (CWCS) has been completed.

The DEP Wildlife Division is taking the lead in developing a Comprehensive Wildlife Conservation Strategy (CWCS) for Connecticut. This will allow the Department and its partners to integrate the management of natural resources, build valuable

Home **Current Status** **Requirements** **Species and Habitats**

Questions and Answers
What is biological diversity, or biodiversity, and Connecticut?
Biological diversity is the variety of life and its processes. It includes the variety of animals and plants, the genetic variations between individuals of the same species, and the communities in which the animals and plants occur and sustain them. The Connecticut DEP maintains an inventory of 2,500 different species, including more than 49 req freshwater and 72 saltwater fish species, 273 bird plant species and thousands of invertebrate species or found only in Connecticut. There are 128 ecolo Connecticut, each with its own distinct combinati

Why does Connecticut need a Comprehensive Wildlife Conservation Strategy (CWCS)?
State wildlife agencies receive wildlife diversity funds. As a condition for receiving these funds, Congress requires that each state develop a Comprehensive Wildlife Conservation Strategy. This strategy must be submitted for approval through the

Species Information/Comments

Common Name	Scientific Name	Tier	Notes
American Bittern	<i>Botaurus lentiginosus</i>	Most Important	State Endangered

Get Involved
We are very interested in your comments, but are unable to respond to everybody's comments. If you have a particular question that requires a direct response, please email the Wildlife Division at dep.wildlife@po.state.ct.us.

Important Habitats and Conservation
- Freshwater Marshes
- Sparsely Vegetated Inland
- Tidal Wetlands

WHO SHOULD PARTICIPATE?
Biologists and ecologists Universities



Connecticut's Comprehensive Wildlife Conservation Strategy

The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities, and employment opportunities without regard to race, color, religion, age, sex, physical and mental disability, national origin, ancestry, marital status, and political beliefs.

In conformance with the Americans With Disabilities Act of 1990, the DEP makes every effort to provide equally effective programs and services to people with disabilities. Contact the DEP Wildlife Division for more information.

Photos © PAUL J. FUSCO

PRINTED ON RECYCLED PAPER
3/05



State of Connecticut
Department of Environmental Protection
Bureau of Natural Resources
Wildlife Division
www.dep.state.ct.us

A WIN-WIN APPROACH

This strategy is not about more regulations, but all about positive ways to conserve wildlife and habitats:

- Saving millions of taxpayer dollars by saving species before they become endangered.
- Working to prevent conflicts between development and wildlife.
- Investing in outdoor recreation and nature tourism (the fastest growing segment of tourism) by taking care of the resource.
- Passing on a healthy wildlife legacy to children.

To be placed on Connecticut's CWCS contact list for updates and information, please submit the form below to the DEP Wildlife Division, P.O. Box 1550, Burlington, CT 06013, or call (860) 675-8130. Your name and address information can also be e-mailed to wildlife@po.state.ct.us.

Name: _____

Affiliation: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: _____

E-mail: _____



CONNECTICUT'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

The DEP Wildlife Division is taking the lead in developing a Comprehensive Wildlife Conservation Strategy (CWCS) for Connecticut. This will allow the Division and its partners to integrate the management of wildlife species, build valuable partnerships, and support efforts to provide more secure, long-term funding for wildlife conservation. Connecticut's strategy will identify species of greatest conservation need and their affiliated habitats and will include action items for addressing those needs. The strategy also will consider other funding available for the conservation of those species.



Timeline for Connecticut's Comprehensive Wildlife Conservation Strategy

Plan & develop project scope	Identify species of greatest conservation need	Identify habitats & communities of greatest conservation need	Develop and prioritize conservation actions	Draft plan with monitoring, review, and evaluation process	Final plan submitted for USFWS approval
January 2004					October 2005

Required Elements of the Comprehensive Wildlife Conservation Strategy

Congress identified eight elements that must be addressed in each state's wildlife conservation strategy. Consequently, the strategy will focus on the species of greatest conservation need, yet address the full array of wildlife and wildlife-related issues. The eight required elements are:

- Information on the distribution and abundance of species of wildlife, including low and declining populations as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's wildlife;
- Descriptions of locations and relative condition of key habitats and community types essential to conservation of these species;
- Descriptions of problems which may adversely affect these species or their habitats, and priority research and survey efforts needed to identify factors which may assist in their restoration;
- Descriptions of conservation actions proposed to conserve the species and habitats and priorities for implementing such actions;
- Proposed plans for monitoring these species and their habitats, for monitoring the effectiveness of the conservation actions proposed, and for adapting these conservation actions to respond appropriately to new information or changing conditions;
- Descriptions of procedures to review this Comprehensive Wildlife Conservation Strategy at intervals not to exceed ten years;
- Plans for coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats.
- Congress also affirmed through this legislation that broad public participation is an essential element of developing and implementing these plans and the projects that are carried out while these plans are developed.

Goals of Connecticut's CWCS

The intent of the CWCS is to create a vision for the future of wildlife conservation. To do this, Connecticut's CWCS will:

- ✓ Address the broad array of all fish, mammal, bird, reptile, amphibian, and invertebrate species;
- ✓ Use available funding to address the species and habitats of greatest conservation need;
- ✓ Identify actions needed to conserve species diversity and keep common species common;
- ✓ Build upon past efforts to conserve all species of wildlife;
- ✓ Encourage the creation of partnerships with conservation organizations at local, state, and regional levels to enhance opportunities for implementation of actions to conserve wildlife.

Getting Involved

There are several steps to developing a CWCS. To implement these steps, input will be solicited from stakeholders that will share responsibilities for this project. Stakeholders include a collaborative partnership of conservation organizations and teams of technical specialists and scientists to analyze data and provide scientific recommendations. That is why you or your organization are needed to help in designing and carrying out the strategy.

Who Should Participate?

- Biologists and ecologists
- Conservation groups
- Private landowners
- Universities
- Local governments
- State, federal, and tribal agencies

Why You Are Needed

A strategy is only as good as its components. Your expertise, ideas, and priorities are needed. To be effective, the strategy must be shaped by the people who know the nooks and crannies of the state, and who understand the issues, challenges, and threats to our precious wildlife.

What's in It for You?

This is the one planning effort you don't want to miss. Your state's strategy will guide the future of wildlife conservation and associated funding. By participating, you will expand networks and coalitions for conserving our wildlife resources. This is your chance to help make history!